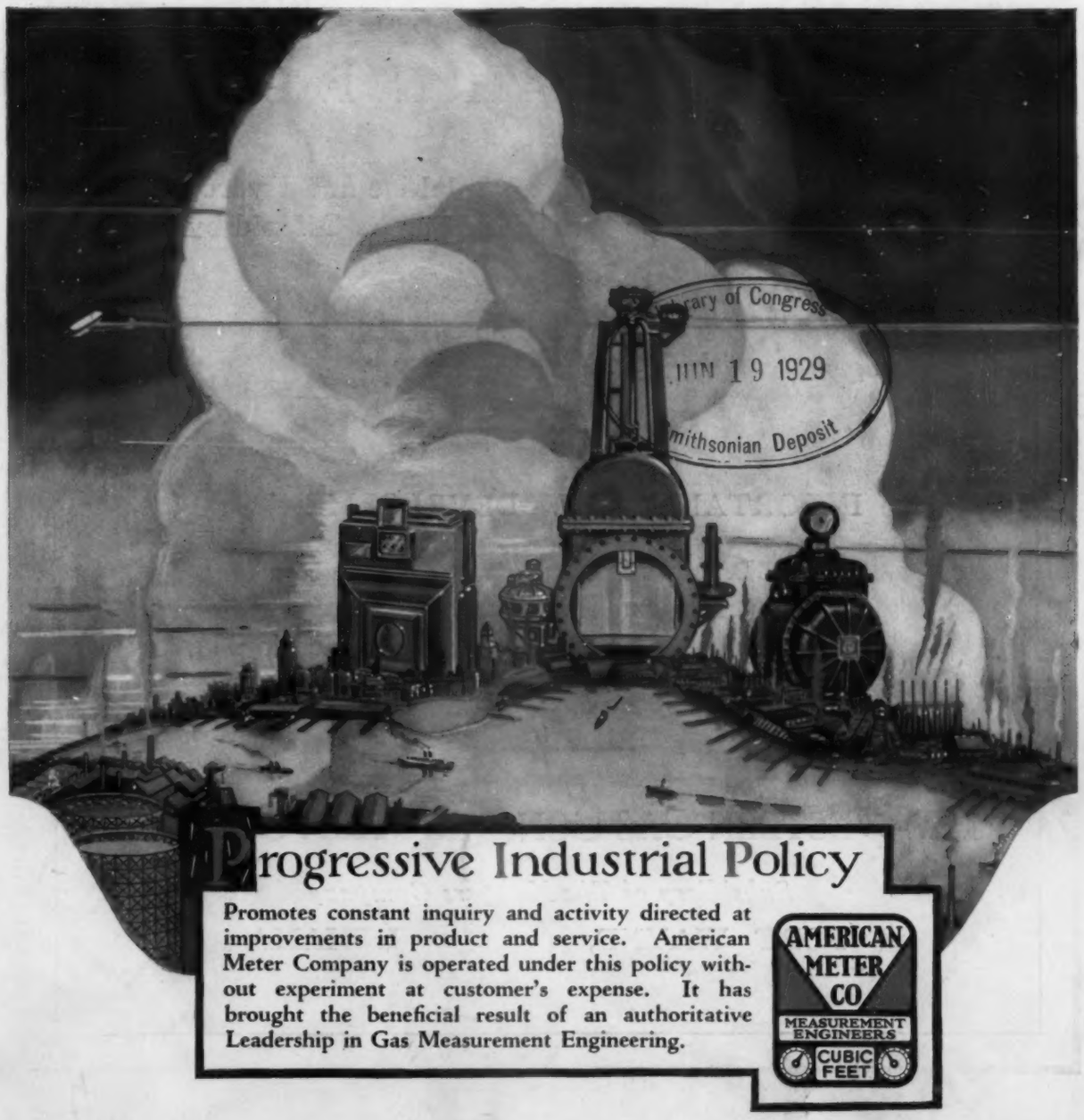
Vol. 130, No. 6 June, 1929 Price 25 cents

AMERICAN GAS JOURNAL

Established 1859 Pioneer of the Gas Industry

Including · GAS INDUSTRY · Est. 1900 ·



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IMPORTANT NEW DEVELOPMENTS:

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FORT WAYNE, INDIANA

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GAS JOURNAL
Established 1859 — *Pioneer of the Gas Industry*
Including GAS INDUSTRY Est. 1900

Executive and Editorial Offices, 53 Park Place, New York City

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Vol. 130, No. 6 — June, 1929 — Whole Number 3666

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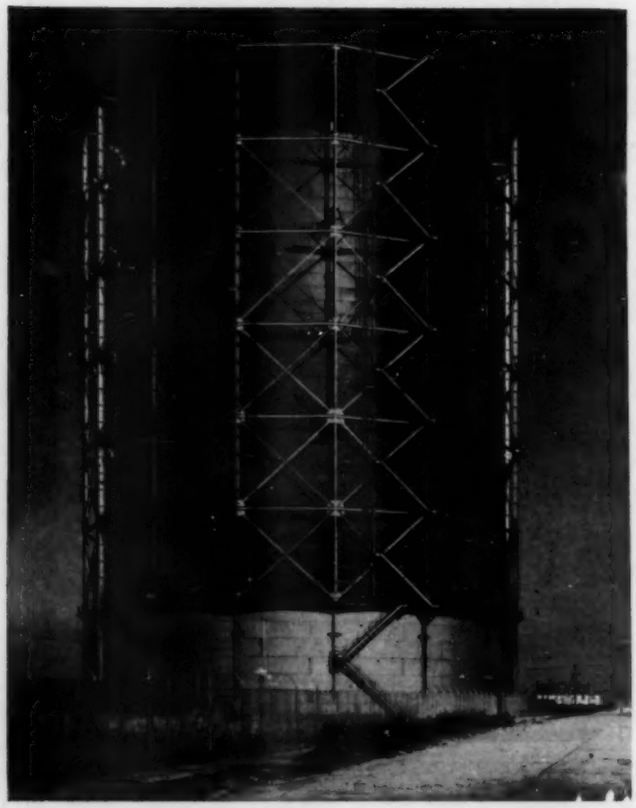
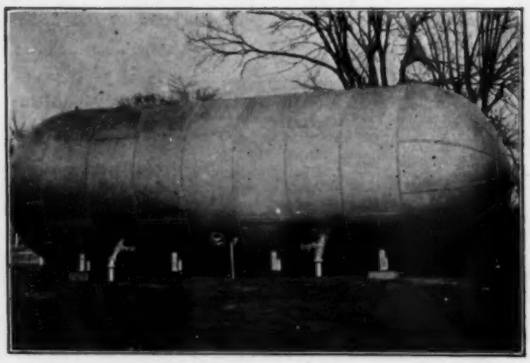


FOR HIGH
AND
LOW PRESSURE



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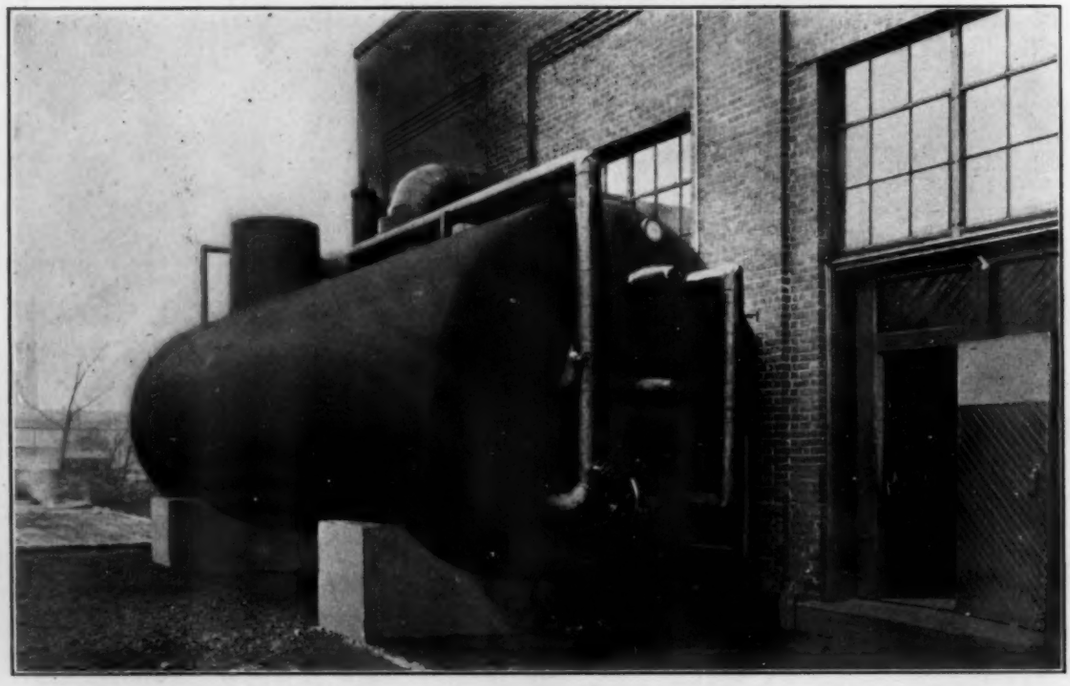
SMOOT STEAM ACCUMULATOR

"EXHAUST STEAM ACCUMULATORS ARE FAST BECOMING A STANDARD PART OF THE WATER GAS MACHINE"

This statement was made by a gas engineer at a Gas Association Meeting several months ago.



Hudson Valley Coke & Products Company, Troy, N. Y. Installation of 9 x 30 Smoot Steam Accumulator. Semet Solvay Engineering Corporation, Engineers.

The Smoot Steam Accumlator is now in use in over 60 Water Gas Plants. These Plants include those having 6′ sets and those having 11′ and 12′ sets.

EXHAUST STEAM ACCUMULATORS ARE A STANDARD PART OF THE WATER GAS MACHINE

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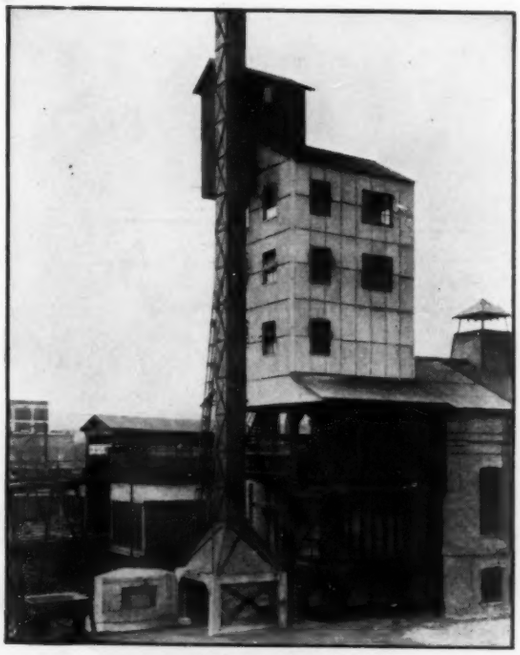

AT DUBUQUE, IOWA

Average Corr. gas made per day	698 M. c. f.
Average Yield per lb. dry coal	6.44 c. f.
Average Calorific value	560 B. t. u.

U. G. I. VERTICAL CHAMBER OVENS

IN SUCCESSFUL OPERATION
Yielding Excellent Gas, Coke, Heating values. . .

In addition to the three Vertical Chamber Ovens illustrated, another, now under construction at Bangor, Maine, will have 300,000 c.f. daily capacity.

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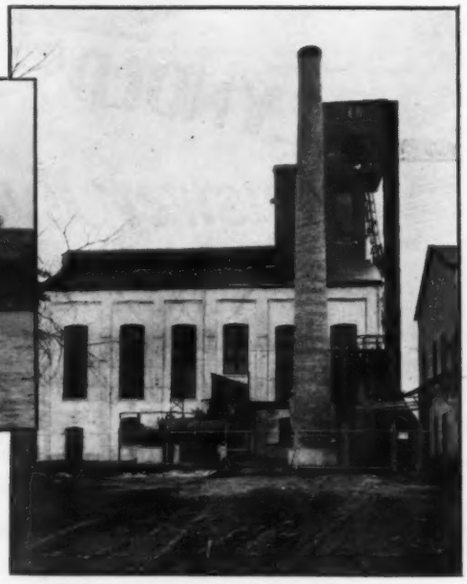
Average Yield per lb. dry coal	7.64 c. f.
Average Calorific value	524 B. t. u.



Average Corr. gas made per day	594 M. c. f.
Average Yield per lb. dry coal	6.85 c. f.
Average Calorific value	543 B. t. u.

AT CLINTON, IOWA

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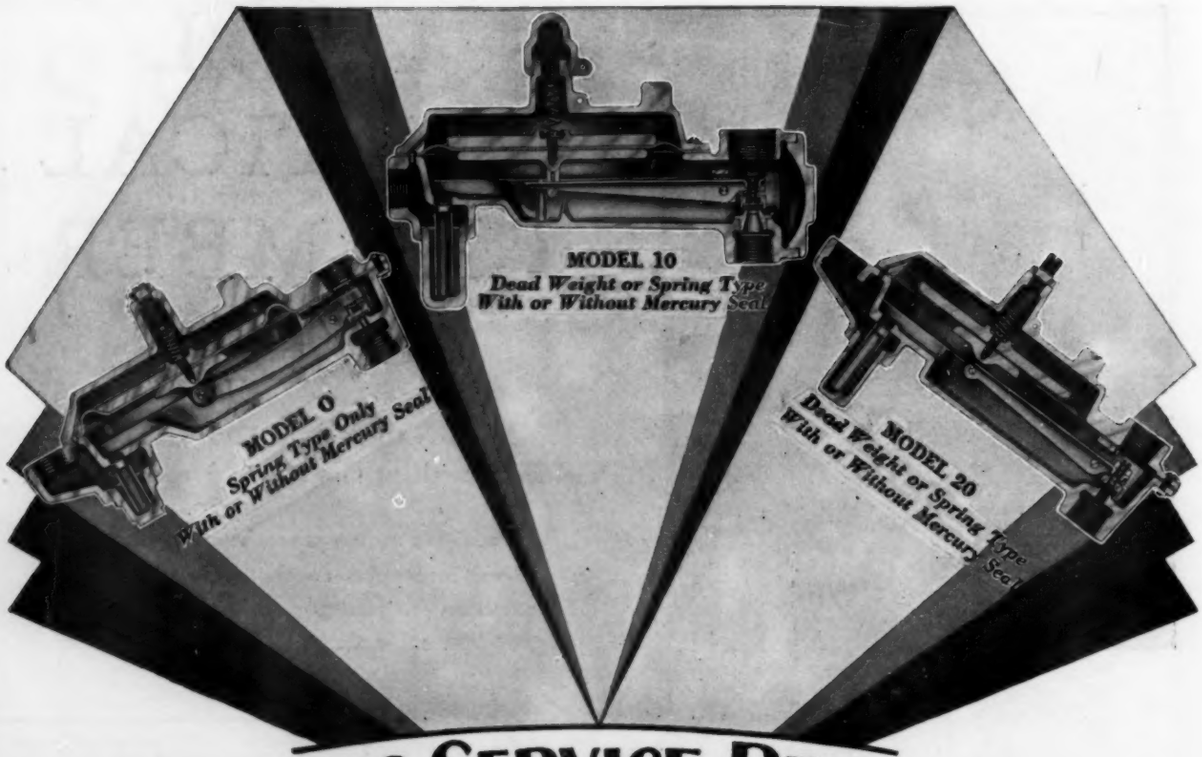

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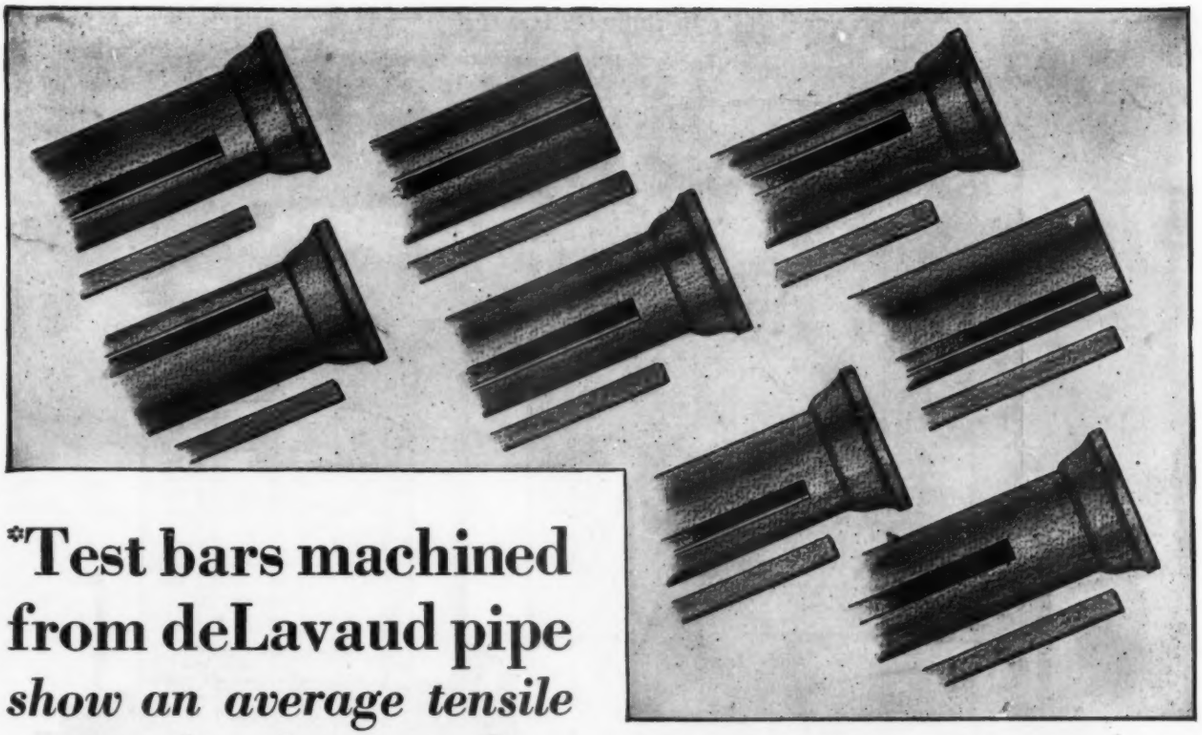

*Test bars machined from deLavaud pipe *show an average tensile strength of more than* 17 tons per square inch

* "The tensile strength of bars machined from deLavaud pipe averaged 35,658 lbs. per square inch. This figure is approximately *100% higher* than that obtained from good pit cast pipe." (Report of actual test conducted by an outside Testing Laboratory. Details on request.)

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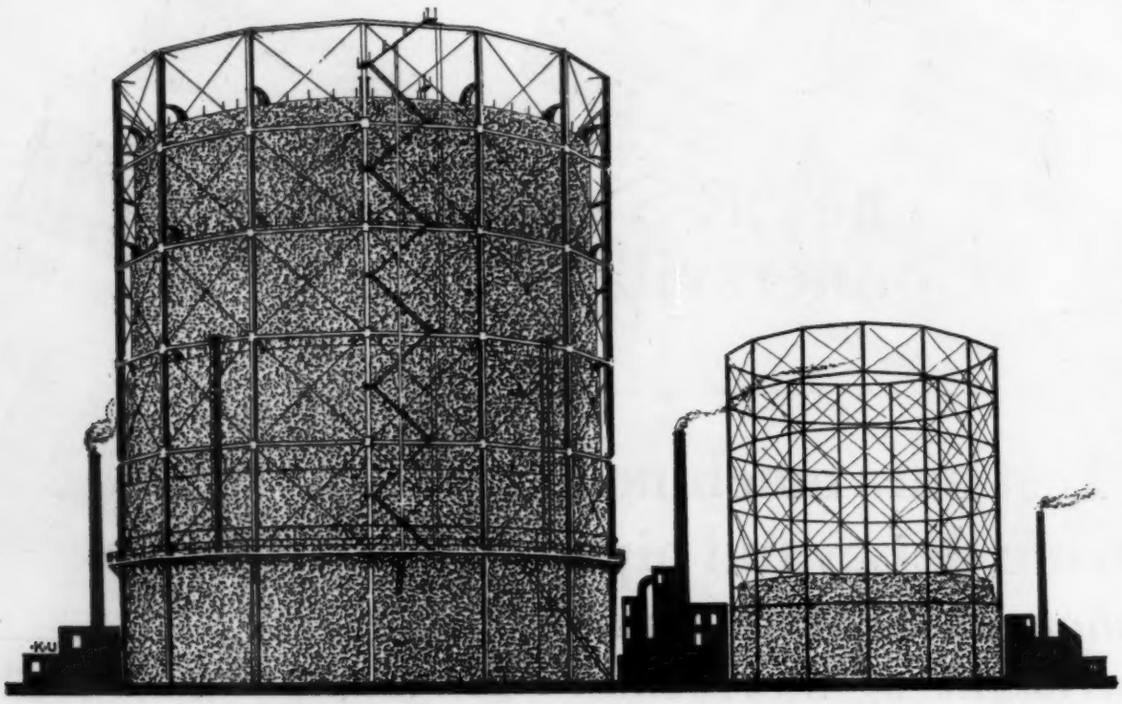

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Greater Efficiency For Positive Results

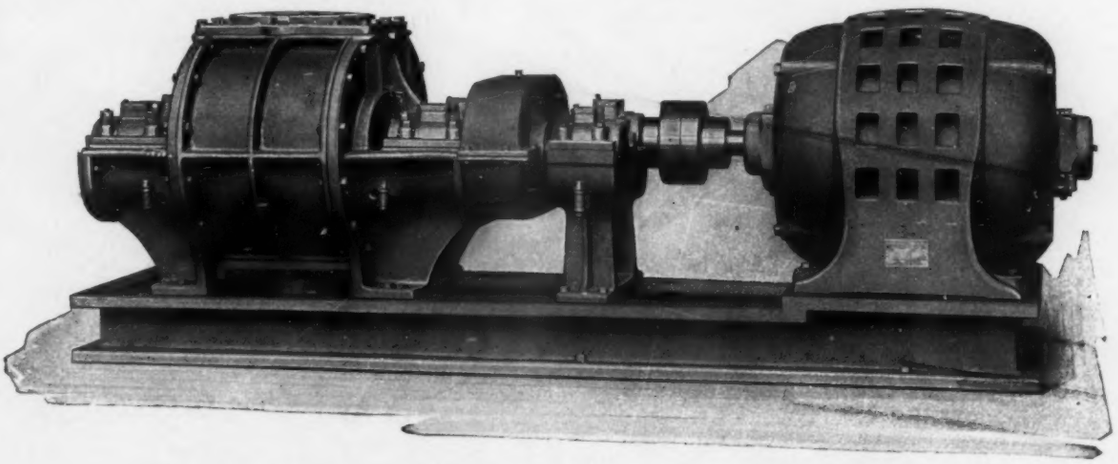
The "R-S" Series Connersville Gas Boosters

Smoother operation at speeds much higher than were practical in gas pumps of previous designs, enables the new "R-S" series of Connersville Gas Pumps to give greater operating efficiencies.

Bearings of the easily renewable babbitt-lined, split sleeve type or of the anti-friction type (whichever is best adapted to operating conditions) meet the requirements of the higher speeds and heavier duties of the "R-S" boosters.

Of course, these "R-S" boosters retain the positive characteristics that have made it possible for Connersville Gas Pumps to increase the gas handling capacity of existing mains through the use of medium pressures; or to assure the industrial consumer of more satisfactory gas burner operation by boosting the gas pressure to the burner.

Bulletin No. 25 gives a more detailed description of the new features which are built into the "R-S" series of Connersville Gas Pumps, explaining why these boosters can serve more efficiently with lower operating and maintenance costs.



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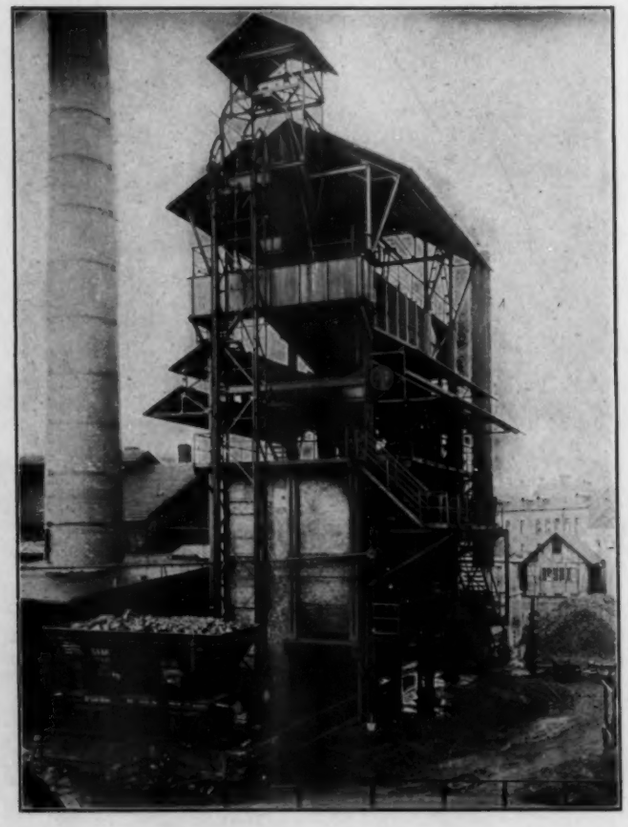

Minimum Labor
Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

City	Time	Yield cu. ft. per net ton	Heating value B.t.u. (gross)
Baden, Switzerland	4 years average	14075	560
Olten, Switzerland	2 " "	13317	570
Friedrichshafen, Germany	4 " "	16045	515

There's a Reason

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—We have built them for others
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These steel purifying boxes were recently completed for one of the large eastern gas companies.

They are completely fabricated and ARC welded in the field. This structure is 64 ft. long, 32 ft. wide and 12 ft deep, divided by a partition into two equal sections.

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The bucket elevator discharges into a screw type conveyor also carried on the Gantry crane, running in a trough provided with discharge gates, and by means of this combination the oxide may be discharged into practically any part of the box.

The spent oxide is discharged thru self-sealing doors in the bottom of the boxes.

In designing the purifiers, provision was made for adding additional compartments as required. The gas manifold has branches for connecting to the future extension.

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for Every joint on the line Victaulic Couplings

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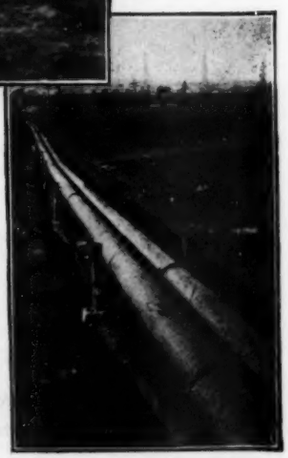

12" gas line and 10" residue gas line, St. Louis, Oklahoma.

FOR a straight away line or for a complicated pipe job of bends, elbows, short pieces and valves, you get greater speed and economy, with the certainty of leak-proof lines, when Victaulic Couplings and Fittings are used.

Unskilled labor and a smaller gang connect lines with Victaulic Couplings faster than with any other type of joint. The lines are flexible and strain-free because each Victaulic Coupling provides a flexible joint which takes care of the contraction and expansion of the pipe lengths it connects.

Victaulic Couplings are supplied for all sizes of steel, wrought iron and cast iron pipe from ¾ inch up—for all pressures from vacuum to ten tons pressure per square inch. Victaulic Fittings make it easy to tie the line to any existing lines.

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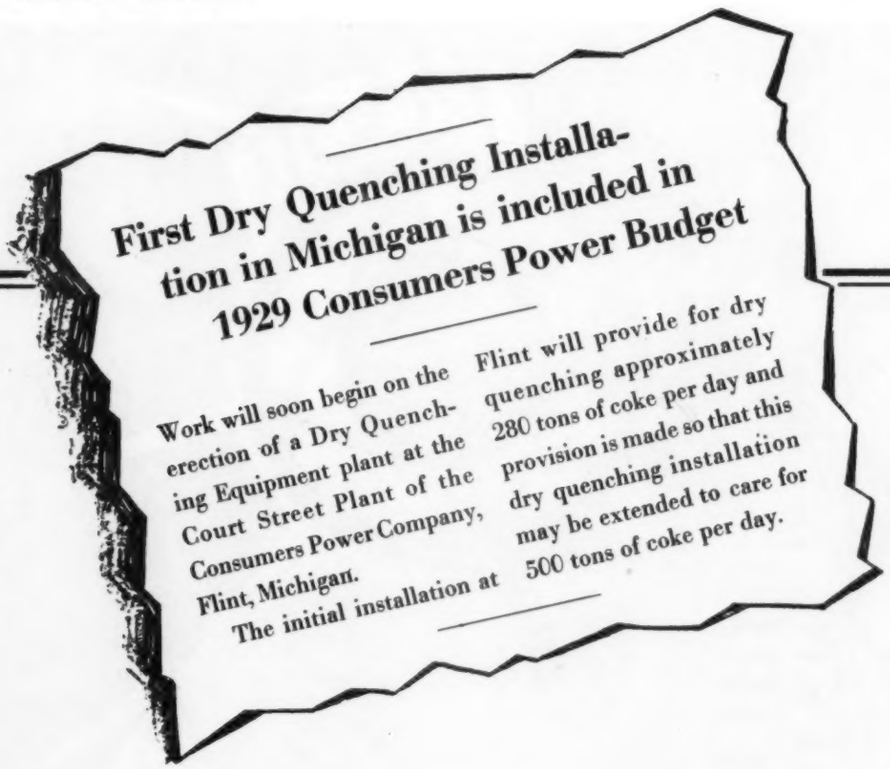

First Dry Quenching Installation in Michigan is included in 1929 Consumers Power Budget

Work will soon begin on the erection of a Dry Quenching Equipment plant at the Court Street Plant of the Consumers Power Company, Flint, Michigan.

The initial installation at Flint will provide for dry quenching approximately 280 tons of coke per day and provision is made so that this dry quenching installation may be extended to care for 500 tons of coke per day.

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Dry Quenching Equipment Corporation

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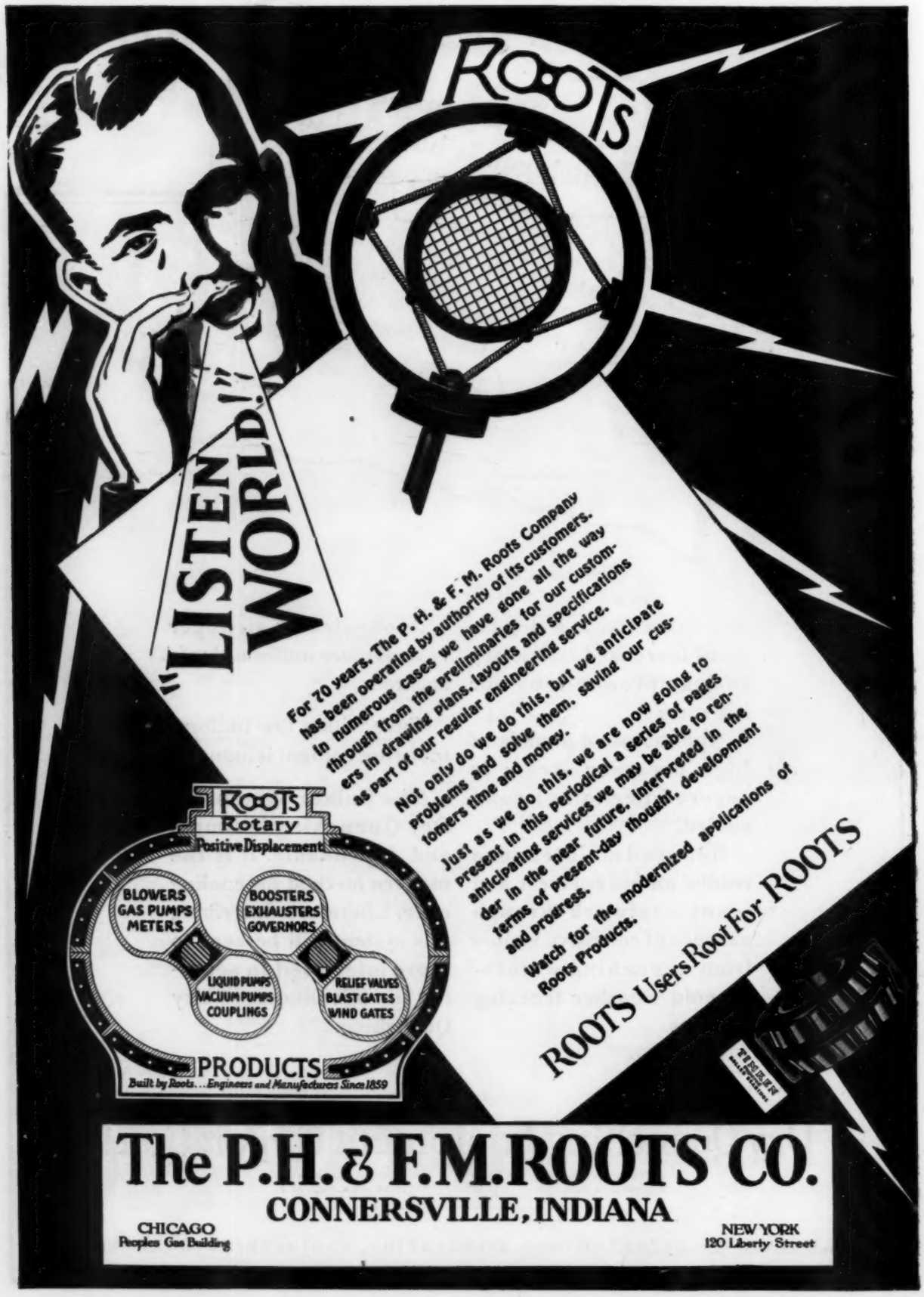
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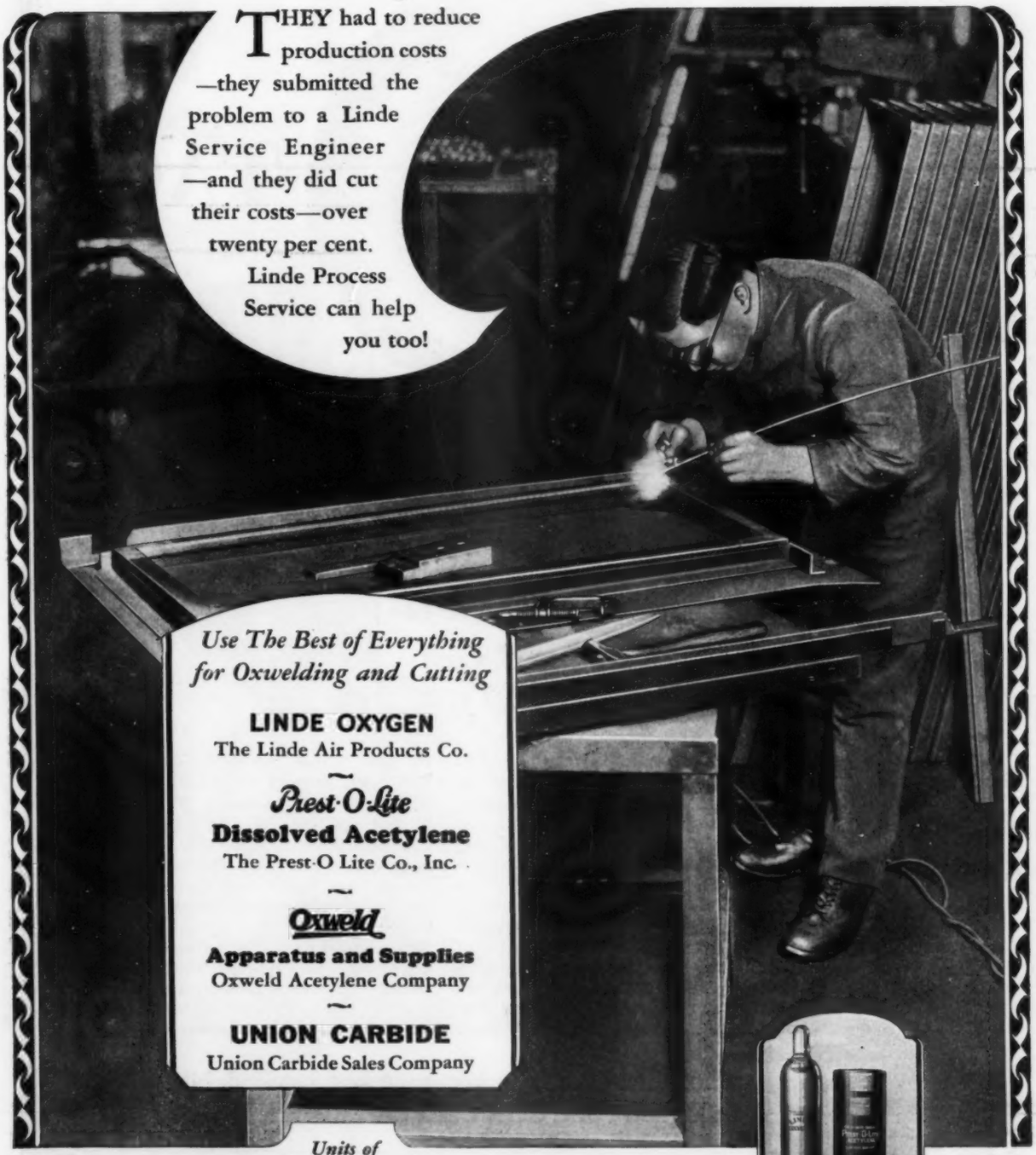
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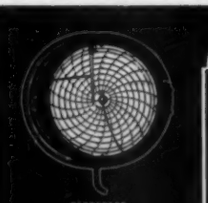
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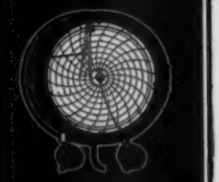
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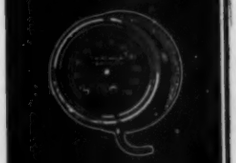
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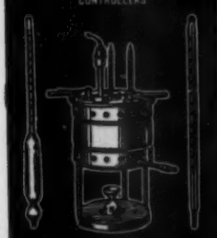
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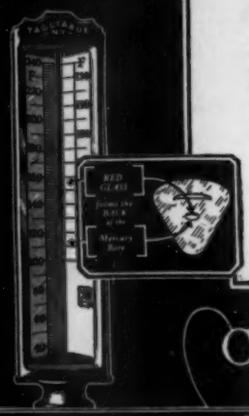

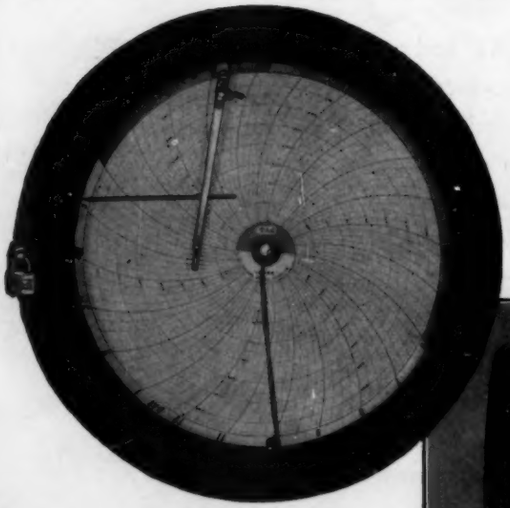

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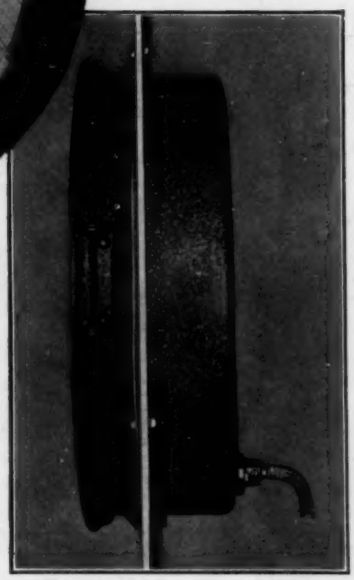

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HENRY M. RILEY, *Editor*

St. Louis and O'Fallon Decision of Limited Utility Meaning

THE LONG-AWAITED and much-discussed decision in the suit of the St. Louis and O'Fallon Railway Company was rendered by the Supreme Court of the United States on May 20. Widely varying opinions have been expressed in the daily papers and in conversations wherever two lawyers or two utility men have met. Some have regarded this decision as extremely far reaching and novel in its significance, upsetting all previous rate-making practice. Others, equally at fault in their interpretation, have regarded the decision as of significance only to the particular railroad involved in the suit.

The truth lies about midway between these two extreme views. The Court, in fact, apparently merely reiterates one fundamental principle of rate making. This principle is that due consideration must be given to present reproduction cost in determining rate-making value. To this extent the decision is old and merely amounts to a reciting of well recognized legal principle.

The new idea, or rather the newly established point of view, is that the Interstate Commerce Commission, and presumably by analogy all state and municipal agencies, are established to *apply* the law as it exists, regardless of the merit of the law. The Court, seemingly, would leave upon the legislative body full and unrestricted responsibility for establishment of the principles of rate making and of valuation involved. The Court denies to the administrative body or commission any privilege of *interpreting* the law in the light of current economic conditions. Presumably, therefore, we must conclude that commissions are required in the future in utility valuations and utility rate making to make conspicuous use of reproduction costs. The extent of such use will depend on the law in the particular jurisdiction to which the valuation is to apply. Thus one might assume twice or three times the emphasis on this feature under one law than under another, and still assume no violation of the principle which the Supreme Court has laid down in this decision.

Altogether, the St. Louis and O'Fallon finding appears to be valuable to utilities in reserving to them full privilege of securing the reproduction-new basis of valuation only where the specific laws applicable under the state or municipality gives such utilities that privilege. To assume a wider application of this rate-making feature is apparently to stretch the Supreme Court decision beyond its intended meaning.

Common Sense in Gas Company Valuations

THE MAKING of valuations for rate fixing is not just now as serious a problem as it often is during a season of aggressive rate-making by over zealous public officials. However, no well managed utility can afford to ignore at any time the proper scheme for maintaining its inventory and valuation status. This means that even in lull times of rate-making, the executive should be laying his plans to meet any potential activity of the future.

One of the surest ways in which to be ready is to maintain a continuing inventory of property. Any well managed company should have such an inventory as a matter of good business management, independent of its rate-making significance. There are well established principles of inventory taking and inventory keeping that must be observed. There are several competent engineering and consulting firms capable of establishing for any company such a system at reasonable cost, if it is not already in vogue. It is well worth while to consider this need in any company that finds itself without such records.

And then there always arises the question—How much is an inventory worth? Certainly some inventories have been excessively costly. The fault in such instances appears to have been, almost invariably, due to unnecessary detail on minor items. One experienced valuation engineer recently remarked in this connection that at least 40 per cent of the cost of any inventory relates to two per cent of the property value. This at once suggests the need of mere approximations on small detail in order that the cost may not become excessive. Cases can be imagined in which the cost of inventory and the maintenance of continuing inventory might actually materially increase the bookkeeping value of the goods to which the records relate. That would, of course, be an absurd result.

Inventories are essential. But needlessly detailed inventories are extravagant. Managements have a difficult problem to steer between the extremes of negligence and of business. A common-sense mean must be determined.

What Is the Cost of a Pipe Joint?

AT THE RECENT Distribution Conference in Boston, the question of joining of mains and services was carefully considered from numerous technical view points. There was omitted, however, one of the vital considerations in pipe-joint study. This relates to the over-all economic cost of a joint, which includes not alone the investment required to make the joint, but also the resulting probability of maintenance or leakage costs.

In connection with this matter it is very much worth while to consider anew the data issued a few years ago by the U. S. Bureau of Mines as a result of a study by E. L. Rawlins on leakage losses from pipe lines carrying natural gas under high pressure. Mr. Rawlins reported typical leakage losses to be expected from pipe lines constructed under what might be termed normal field conditions. The results of his study have been noted by some, but the rather astounding economic significance of them has not been quite as widely appreciated as it should have been. The comparison made by Mr. Rawlins as to "reasonable leakage expected from pipe lines" was based on comparisons of a large number of lines in various parts of the country, after repair of the lines so that they would be considered in reasonably good commercial condition.

Screw-jointed lines varied in leakage losses from 33 to 2015 M per year per mile of three-inch line equivalent. Rubber-coupled lines varied from negligible to 1960 M. Welded lines varied from 10 to 166 M. It is not surprising, therefore, that Mr. Rawlins concluded that "The tests that have been run on welded lines show conclusively that this type of construction is preferable, as far as leakage is concerned."

No one can logically claim that welding is a cure-all for every sort of leakage. However, it seems to be conclusively proven that the initial cost of installation is only a small part, of the whole story of determining what a joint costs a gas company, especially on high-pressure lines. With the distribution of dry gas, with the replacement of manufactured gas by natural gas, and with the constantly increasing of distribution pressures, these joint leakage problems assume increasing importance. Hence, even for low-pressure city-distribution systems, it is very essential that a careful analysis be made of the over-all cost of line assembly, including repair and leakage loss items. It would not be surprising if such careful studies revealed surprising support for welded distribution systems, both for locations that use cast-iron pipe and those where steel tubing is preferred. Both types of pipe lend themselves perfectly to welded assembly if proper welding procedure is observed. This is a subject that demands thorough analysis as the season's program of distribution extensions is undertaken.

Why Not Preprint Convention Papers?

MUCH convention time is wasted by reading of the long manuscripts from the platform. It is doubtful whether any committee report or contributed paper at a gas-man's convention warrants the expenditure of more than 20 or 30 minutes for original presentation. Rarely is there a subject which cannot be condensed within these time limits, to the advantage of the speaker as well as to the great comfort of his audience.

The principal handicap of the convention program management when it undertakes such condensing of reports and papers is the fact that the speaker rightly says this leaves many phases of the subject untouched and unavailable to the audience. That defect can be remedied in only one way, namely, by preprinting of reports and papers.

Preprinting is not a cure-all for poor conventions, but it will do much to raise the standard of gas-man gatherings and to conserve the time of those in attendance for that more vital and important function of real dis-

cussion. Indeed, the "lobby conference" is more valuable than a protracted tedious platform presentation of even a worth while paper.

Sound Classification of Gas Sales

COMPARABLE data regarding merchandising success in various communities is highly desirable, not only for the industry as a whole, but also for each individual management. Comparisons based upon properly classified returns permit each management to determine whether its various divisions are making the progress to be expected or whether they are falling behind in certain lines.

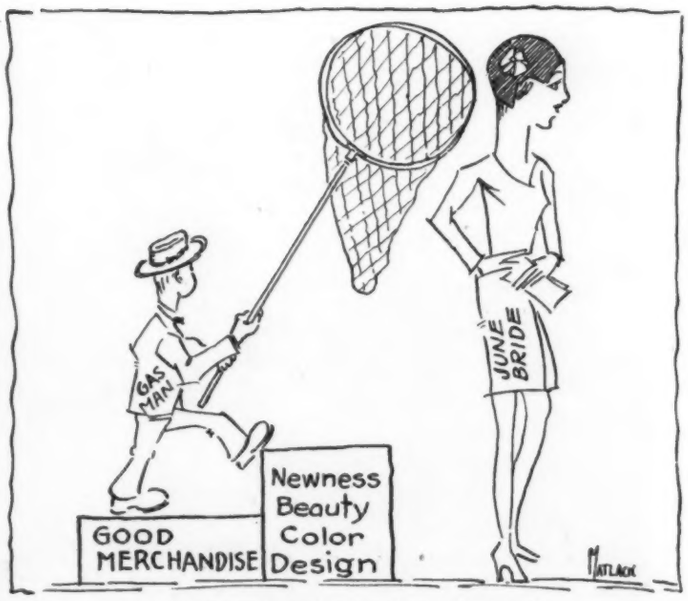
The Statistical Department of the American Gas Association has been laboring with the problem of classification of gas sales for several years. It has made splendid progress and has had most encouraging cooperation from the majority of the companies, big and small. However, there remain a few concerns in the industry which have not yet adopted the standard classification proposed and hence who are not yet fully cooperating with the A. G. A.

If for no other than selfish reasons, such cooperation should be forthcoming at once. Managers should make sure that they have a proper grouping of hotel and restaurant sales, of industrial business, and of household uses of gas. If any management is in doubt about this matter, Mr. Paul Ryan, head of the statistical work of the Association will be very glad to cooperate in bringing its classification in line with standard practice. Those who are in doubt will do well to look into the question of their own company's practice at once. It is not nice to be out of step with the industry, for there will be no fond mother on the side lines to remark: "Everybody is out of step with Johnny."

Lessons from the Production Conference

MANY OF US are at times inclined to reason that the production of gas is rather an open and shut proposition and that the gas plant engineer does not have any particularly worrisome problems, such as confront the sales department for instance. Attendance at the recent Production Conference in Baltimore, even for only a short stay, would have speedily dispelled any such erroneous idea. The production man does have his problems.

However, it is important that we distinguish between problems that arise due to lack of a thorough understanding of the various gas manufacturing processes and those which we might consider as being self-inflicted. By this latter designation is meant those



Will he capture the new Home Manager?

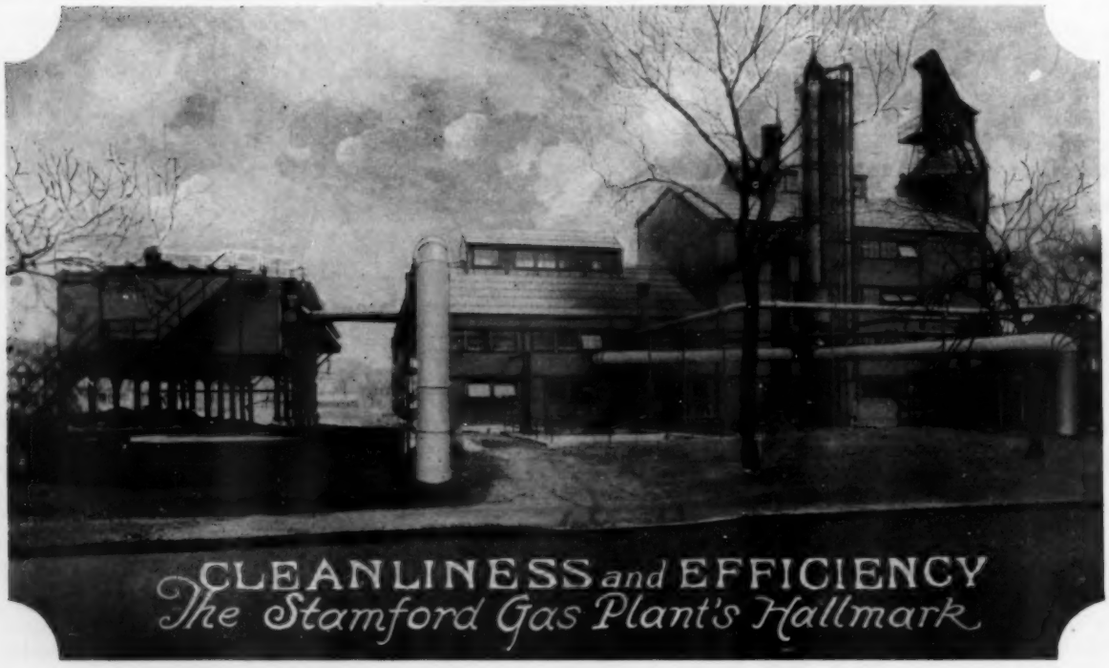
difficulties which the gas engineer creates due to his insatiable desire to always find a cheaper and better way to accomplish the particular task. And this desire is nothing but the sprightly offspring of research.

Never has there been a time in our industry when the gas plant engineer was so keen to tear down a water gas set, for example, and reassemble the whole in order to test out a theory which he has previously convinced himself will come reasonably close to working. It is refreshing to consider that the present day gas production man is imbued with a spirit of technical daring and adventure backed by a generous share of imagination. And the management has happily caught his enthusiasm and stands ready to go the limit with him.

It should be distinctly understood that the production of gas is essentially a chemical engineering process and as such demands the service of key men trained along chemical engineering lines.

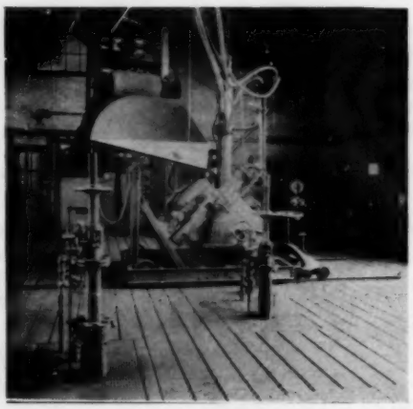
There should be no doubt on this score, particularly on the part of the management. Further, all companies, regardless of size, should endeavor to have their plant destinies in the hands of men who are familiar with the principles of chemical engineering involved in gas making. Many small companies might find it feasible to retain a part time consultant to handle its chemical problems.

From the Production Conference might be gathered the lessons that our problems of gas making are in the hands of vigorous individuals who know precisely what they are doing and further, gas making is a rather complicated branch of chemical engineering and should be technically administered accordingly.



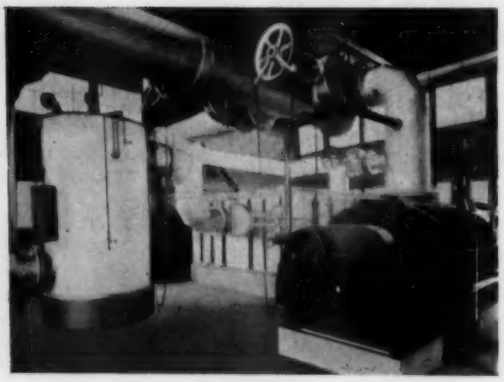
Top—Water Gas Works at Stamford, Conn. From left to right are: Outdoor purifiers; building housing gas-handling equipment and pump room, with tar-liquor separator in foreground; building (high section) housing generating equipment, with washer-cooler in foreground and fuel-handling system beyond; and recirculating liquor-cooling coils at extreme right.

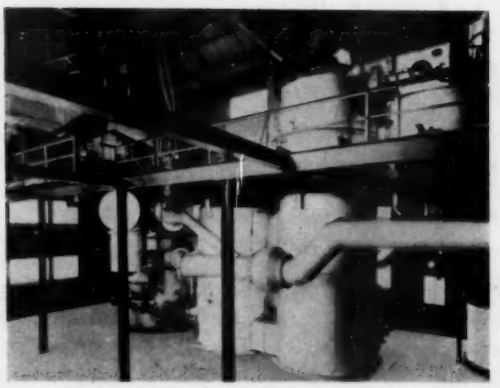
Center—Water gas operating floor. Conveyor to bring coke from hopper, charging machine and automatic control are shown; generator and carburetor blast valves in the foreground.



Lower right—Water Gas Machine. A 9-ft. set with back-run connections and automatic charging and clinkering accessories.

Lower left—Gas Handling Equipment. From left to right are shown: P & A tar extractor, multiple washer and steam driven exhausters.





Planning for Efficient Operation in the Small Water-Gas Works

By R. S. McBride,

Consulting Editor, American Gas Journal

WATER-GAS plants are commonly the result of years of growth with gradual improvement and additions. Rarely does one find a plant that has been erected all at one time according to the latest ideas of construction and designed to take full advantage of modern equipment and methods. However, The Stamford Gas and Electric Company, Stamford, Connecticut, is fortunate enough to have such a works, which has been erected and put into operation recently typifying the latest ideas of automatic and efficient manufacture of water gas.

The base-load gas supply of the Stamford company is made in a recent installation of Glover-West vertical retorts; but a substantial percentage of the total send-out is water gas from this new plant. This percentage varies widely according to the total gas demand of the system of Stamford, Darien, and Greenwich, the last of which cities gets its gas from this works through the Greenwich Gas Company, a large wholesale customer of the Stamford company.

In the planning of its water-gas unit the local management found it necessary to select an installation that could be widely varied in output without sacrifice of operating efficiency. This demanded not only flexibility of apparatus and carefully controlled capital expenditure, but also an installation that would be so largely automatic in its functioning that the labor requirement would be low and hence the labor costs reasonable even when the plant is operating during a relatively small part of the 24 hours each day. As a matter of fact the water-gas set is often started up and shut down four or five times per 24 hours, to take care of load variations accentuated in effect by small holder capacity.

This new plant was erected by the Semet-Solvay Engineering Corporation, according to plans prepared under the general direction of Mr. Geo. B. Leland, vice president of operations of The Stamford Gas and Electric Company. The result of careful planning is an installation which is highly suggestive of good modern practice for any water-gas installation in a works of moderate size.

The Automatic Generator

Almost completely automatic operation of the generating equipment has been arranged in this plant, a result not commonly thought essential in small works. The management at Stamford believed, however, that such automatic functioning of the equipment was especially important if labor costs were to be kept low per M when the total number of operating hours per day was small. This meant that the number of men per shift must be maintained at a minimum. As a matter of fact, the requirement of the water-gas department at Stamford is only three men per shift. This group consists of one gas maker, one pump and compressor attendant, and one laborer.

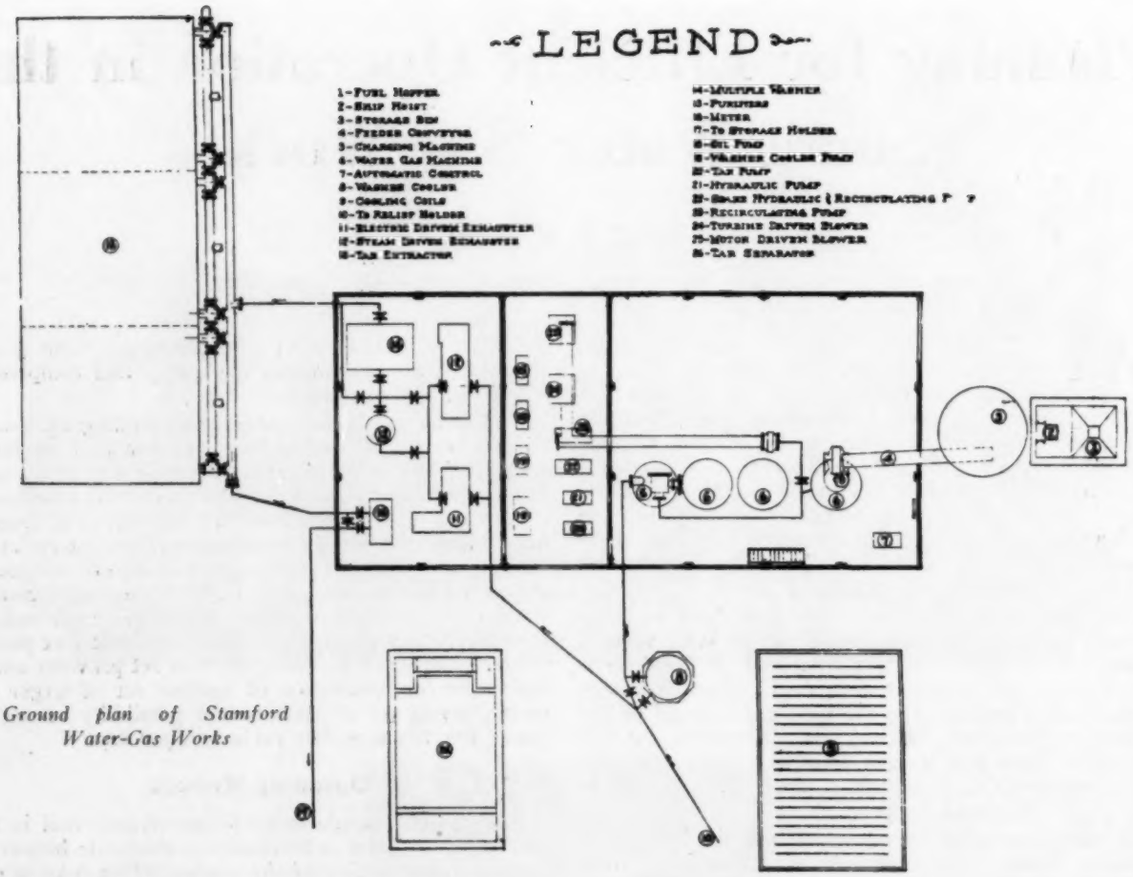
The water-gas house and all gas-handling equipment of this plant are designed to care for two machines with combined daily make in excess of five or six million cubic feet of water gas. The present set consists of a standard Steere generator, carburetor, and superheater with complete back-run connections, Steere automatic grates for ash discharge, and Steere automatic charger. The latest type of U. G. I. automatic control is used for operation of the set, which has a gas-making capacity of approximately 2.5 million cubic feet per 24 hours. The space adjoining the first set provides ample floor area for installation of another set of larger capacity, giving an ultimate output possibility of water-gas of five to six million cubic feet per day.

Operating Methods

Egg-size coke made from Westmoreland coal in the vertical-retort plant is trucked to a road-side hopper in the water-gas section of the works. This coke is elevated by a skip hoist to the over-head coke-storage bin from which point it automatically feeds to the machine as required. Any fines which have formed in this coke during handling are screened out upon discharge from the storage bin. This discharge is controlled by a rotary feeder which delivers onto a screen which in turn feeds a belt conveyor carrying the coke directly to the charging machine on the generator. Both feeder and belt start and stop automatically at the proper point in the gas-making cycle by a suitably interlocked set of electrical contacts.

Up-run steam for the generator is supplied from a high-pressure steam line run to the water-gas unit from the near-by electric generating station of the company. Down-run steam is in part from the same source and in part is made by flashing effluent water spray into a steam in the top of the superheater during the back run. This effluent is taken from the liquid re-circulating system of the works described below. At the present time the works are being operated without accumulator or waste-heat boiler. It is believed, however, that when the second machine becomes necessary at least an accumulator and perhaps a waste-heat boiler will be economically justified.

Some steam is also made in the generator from a very small quantity of effluent water introduced through side-wall clinker-removing sprays directly onto the refractory lining, of the generator. This water, forming steam on the generator lining prevents the adherence of clinker to the side-wall of the generator. This scheme has worked with great satisfaction in this plant, preventing any clinker accumulation in the form of a side-



Ground plan of Stamford Water-Gas Works

wall ring. It is believed by the designers of this system that the same scheme is quite generally applicable to most coals and cokes.

At the present time the ash which is discharged by the automatic grates is allowed to accumulate in the base of the generator until periodically removed. When the set does not operate 24 hours per day, it suffices to have the ash removed from the bottom of the machine twice per day.

For close control of the generating operations a continuous recording pyrometer is installed with the thermo-couple in the cross-over between the carburetor and superheater. A second pyrometer couple is in the top of the superheater. The temperature at the latter point is obtained by turning a two-point switch at the recorder.

By means of these and other control indications the gas maker is able to maintain very uniform and efficient operation of the set, adjusting details and modifying the cycle as required for best efficiency.

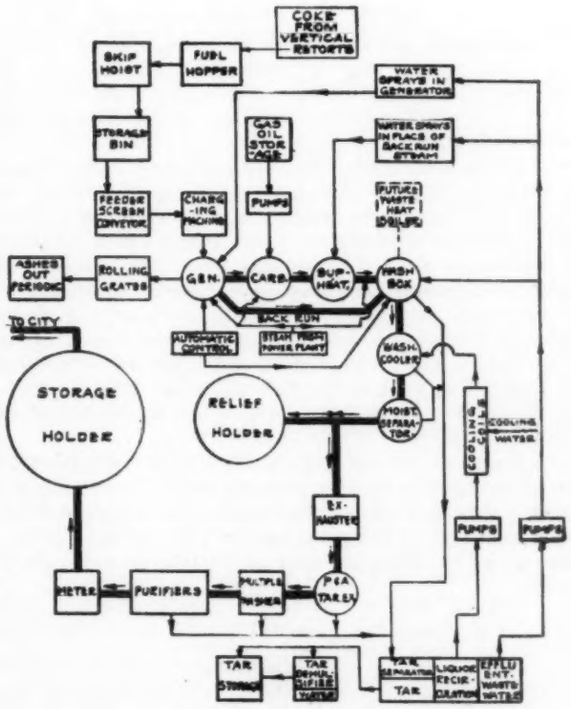
Gas-Handling System

The raw gas which enters the wash box through the superimposed three-way back-run valve goes from this point to a Doherty-type washer-cooler. This unit is a direct-contact grid-filled steel tower approximately 8 by 55 feet in size, serving for cooling of the gas. Any moisture of tar spray carried out of the washer-cooler is removed on the discharge leg in a Steere moisture separator from which unit the gas passes to the Connersville exhausters.

A relief holder floats on the line between the moisture separator and the exhauster. The connections are so arranged that only such gas passes into the relief holder as is in excess of the gas-handling capacity of the exhauster and subsequent units. Hence, during the make period of each cycle some gas passes into the relief holder and during the blast period gas passes from the relief holder to the exhauster. This arrangement was particularly important in this works, since the relief holder is located more than 500 feet away in the old part of the plant. It was obviously undesirable to have all of the gas travel unnecessarily so great a distance to the holder and back. Hence, the described arrangement was adopted in order to permit satisfactory functioning of this holder as a control unit with a minimum size of pipe line between it and the water-gas system.

The exhauster forces the partially cooled gas through the P & A tar extractor, a multiple washer, the purifier, a Connersville station meter, and into the commercial gas holder for city supply. There are two exhausters installed at this plant, one steam-engine driven and one electric-motor driven, serving as spares the one for the other and insuring service regardless of failure of either electric power or steam supply. A similar plan in blower drive has been arranged, one unit being electric and one steam-driven.

The purifier system is equipped with a 15-valve reversing manifold, which will control the flow of gas so that any two boxes can be reversed with each other and at the same time maintain the third clean box between the two boxes so reversed and the town. By thus rotating two boxes, it is possible to play them



Material Flow Sheet

against each other until one of them does not clean up on the reversal. By this plan the number of times the oxide has to be taken out and revived is decreased. The purifiers are also equipped with reversing valves in each box, so that the direction of flow within the box itself can be changed without changing of valves in the manifold. This is accomplished by simply throwing the lever handle of the reversing valve.

The gas-handling units, both indoors and out, are assembled with welded joints and connected with welded pipe lines. All metal areas have been carefully painted first with black priming coats over the red-lead shop coats and finally with aluminum paint. The result is a pleasing and neat appearance not always found in gas works.

Tar Liquor System

All of the tar and condensate from the gas-handling system is delivered to the tar-liquor separator. The first section of this separator is double the width of the intermediate sections and has in each end a tight compartment. One of these compartments acts as a sump for such plant drips as are too low to flow by gravity into the separator trough; the tar and condensate are pumped from it at intervals into the separator. The opposite compartment acts as an accumulator for the tar emulsion which has settled out in the tar extractor. Tar and emulsion are drained from the first section of the separator into this accumulation compartment and pumped thence to storage.

Between the two compartments but near the top of the separator is a seal trough which extends from compartment to compartment. It is of such depth as is necessary for the sealing of the drip lines flowing into it. Between the trough and the first sections of the separator are screens for retaining in the trough such coarse or heavy material as may come over in the water draining from the wash box. Such material as is held in the trough by these screens can be easily removed with scoop shovels.

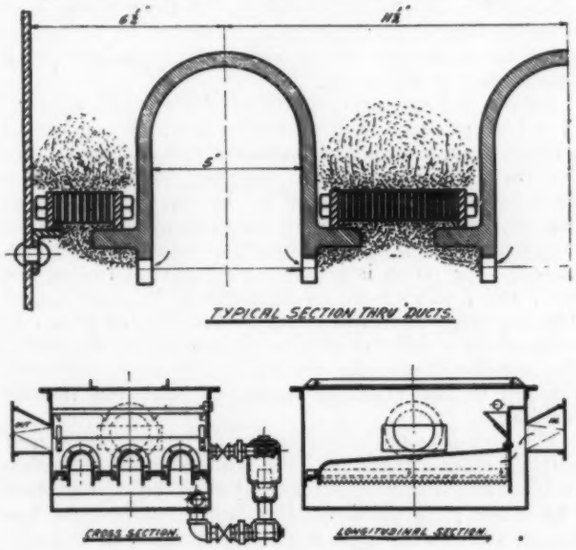
The last baffle is really a solid partition wall. This makes the end section, which is double the width of the intermediate sections, a sort of tank. This is the outlet or clear-water section of the separator and holds the supply of clear recirculating liquor. The tight baffle allows the level of the liquor in this section to rise and fall without affecting the balance of the separator.

Water from this clean-water end of the separator is recirculated through the wash box and a part of it is used in the clinker removal sprays in the generator. Any surplus clear water is used in the top of the superheater for the generating of back run steam. Ordinarily no condensate flows from the separator to the sewer. However, to protect against a surplus of clean water, this compartment is provided with an overflow to the sewer.

The separator is supplied with skimmers for removing such oil as accumulates on top of the liquor. This oil is drained to the tar compartment.

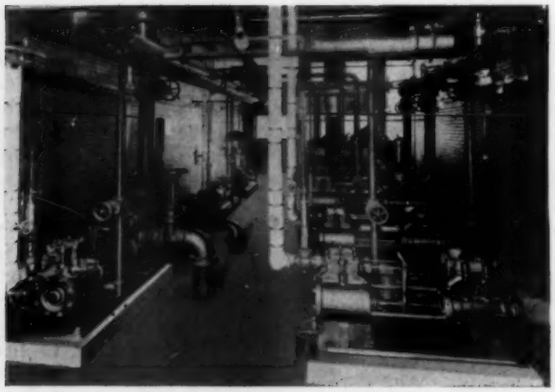
Water for recirculation to the washer-cooler is taken from the first pass of the separator by the recirculating pump and forced to the top of the washer-cooler through banks of the conventional type of cooling coils. Cold salt water trickles down over the outside of these cooling coils, the supply being taken from salt-water lines used for cooling in the adjoining electric station of the same company. This salt water runs from the sump under the liquor-cooling coils to waste through the plant sewer system.

The quantity of "effluent" in this plant is not quite enough to furnish the requisite steam for the back-run portion of the gas-making cycle. Hence, small amounts of make-up water are added to the system. Because of



Multiple Gas Washer

this fortunate condition there is absolutely no effluent to be discharged from the liquor-handling system into the sewer. Thus there is no chance whatsoever for the escape of oil or tar into the near-by waters of Long Island Sound. This fact, is, indeed, one of the reasons why the back-run generating system is being used at Stamford. The plant here is located so near oyster beds and the adjoining anchorage of fine pleasure yachts that the local management could not risk any possibility



Pump Room. Eight pumps shown include oil pumps, washer-cooler recirculating pumps, tar pump, one effluent pump, one hydraulic system high-pressure water pump and one spare, which may be used on either hydraulic or effluent system. Note compact arrangement of equipment and piping, but complete accessibility for maintenance and repairs; good "housekeeping" is also evident.

of oily effluent introducing troubles with yacht owners or public authorities interested in maintaining a clean water-front.

Hydraulic Valve Operation

It is of interest to notice how this plant is arranged to maintain a spare pump for both effluent returned to the water-gas machine and for maintenance of pressure in the hydraulic system which operates the valves and other mechanisms of the gas-making equipment. There is one pump customarily used for effluent and another for the hydraulic system. A third pump is so connected by a manifold that it serves as spare for either one of the two others, thus making a fourth pump unnecessary at this point.

Valves and operating parts of the set are actuated by a high-pressure hydraulic system which consists of a drain tank, pump, and pulsation tank. The suction line from the drain tank to the pump is looped and a small breathing valve placed in the top of the loop so that by regulating the size of the opening of this valve, the quantity of air drawn into the system can be regulated. The pump is pressure-governor controlled and has a relief valve from its discharge to its suction side. The discharge from the pump passes into the pulsation tank, where it delivers close to the surface of the water, thus making it easy for the air it contains to pass into the top of the pulsation tank and maintain the air cushion.

The high-pressure water line to the valve-control nest is taken from a point near the bottom of the pulsation tank so that water reasonably free of air is obtained. The water passes through the control nest to the hydraulic valves and back to the drain tank. The high-pressure tank is of sufficient size to care for three complete operating cycles. Hence, if the water pump should fail for any reason there is ample time to shut down the machine before the pressure will fall far enough to interfere with any valve action.

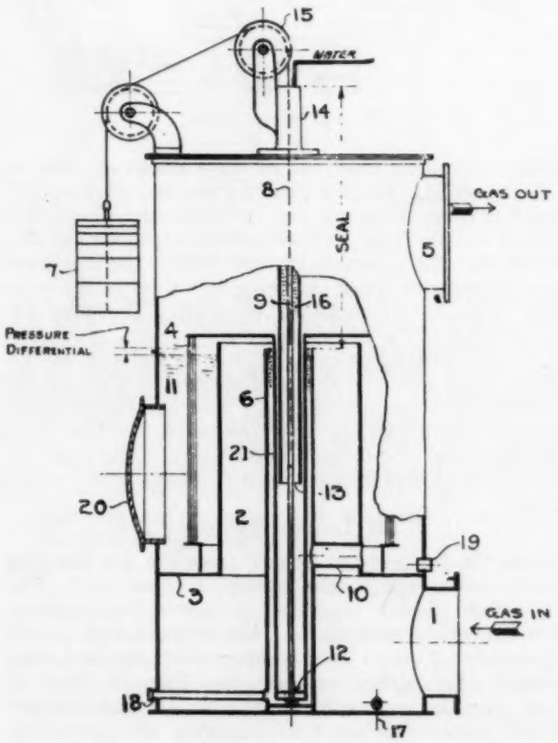
Dual speed control on various valves has been fully developed in this plant. By means of these devices a suitable portion of each valve stroke is rapid or slow as may be required for the best machine functioning. Refinement of operation is thus just as fully accomplished here as in the largest works.

Layout and Construction

Plant layout has been accomplished to afford a compact and yet thoroughly convenient arrangement of equipment, pumps, and gas-washing equipment. The primary washer-cooler, purifier, and tar-liquor separator are out-doors.

The type of building construction which was adopted for the Stamford works on the occasion of the erection of the vertical retorts some years ago has been used in the water-gas works also. This construction provides a steel frame work, the openings in which are filled with brick or steel-sash windows, as required. Thus the exterior walls, as well as the partition, are only a single brick in thickness and of most economical construction. Care has been taken to proportion the various structures so that the general appearance of the property is good, an important factor in any works for establishment of friendly relations with its neighbors.

General results thus far obtained in the operation of the plant have been very pleasing to the local management. Precise data on efficiencies obtained cannot yet be reported, since the plant has been in operation only a few weeks including the time of starting up and adjustment.



Inner-Seal Tar Extractor. The gas enters through the inlet nozzle (1) passes upward through the standpipe (2), through the perforated plates (4) and out through nozzle (5).

The plates (4) form the skirt of a drum which dips into the tar and liquor seal (11). This drum, which is counterbalanced (7), rises and falls to meet any variation in the quantity of gas passing through.

The tar and liquor from seal (11) passes through connection (10) into pipe (6). Such tar and liquor as is needed is used in maintaining seal (16) while the balance overflows from pipe (6) into the lower or inlet compartment of the tar extractor. From here the tar and liquor overflows to the drain lines through overflow connection (17).

Better Data Needed on Natural Gas

PHENOMENAL growth is taking place in the use of natural gas for public-utility purposes. Every interest, including producer, pipe-line company, distributing utility, and the public, would be better served if we had promptly available more precise data on the trends in this development. *American Gas Journal* made inquiry of government officials regarding the present status of natural-gas statistical work. The letter printed below from Mr. Swanson, who heads the petroleum and natural-gas economics work of the Bureau of Mines, is the self-explanatory response received.

American Gas Journal wishes to answer this communication with a very definite assertion that at least quarterly, and perhaps monthly, reports on pipe-line deliveries of natural gas should be had.

We believe that thinking men in the natural-gas industry will agree with us in this conclusion. If they do, they should write regarding the matter to the Bureau to give such encouragement and assurances of cooperation as may be possible in each case. By encouragement and cooperation this statistical work can be made sure. And with the results which it will afford the natural-gas men of the country can much better chart their plans for efficient and profitable public service.

To the Editor of "American Gas Journal"

The Bureau of Mines has received your editorial inquiry regarding the statistical data of the natural gas industry, which are now available, and your further inquiry as to the possibilities of procuring additional information currently to indicate trends in the public utility distribution of natural gas for domestic and industrial consumption.

The statistical data on natural gas now published by the Bureau of Mines are:

1. "Natural Gas"—An annual chapter covering the quantity and value, by states, of the natural gas produced and delivered to industrial and domestic consumers. The 1927 chapter, released January 22, 1929, is the latest available. Based on reports received annually from producers.

2. "Carbon Black"—An annual chapter showing, by states, the quantity of carbon black produced and the amount of natural gas consumed in its production.

3. "Natural Gasoline"—An annual chapter covering the extraction of gasoline from natural gas. Monthly figures on the production of natural gasoline are published in the monthly petroleum statement.

The reports listed above have been published in their present form for a number of years and, during this period, there have been no changes in the quantity or character of the statistical data available although, as you know, the industry has grown, quantitatively and geographically, to a marked degree. It has been suggested frequently to the Bureau of Mines that the natural gas industry and others allied with it would be interested greatly in a regular quarterly report which would record the quantities of natural gas transported by public utility companies for industrial and domestic consumption.

Such a quarterly report would be based on the pipeline deliveries of the principal distributing units and might, as well, be supplemented by some data regarding field use and consumption in the manufacture of carbon black. The value of such a report would depend primarily upon the extent of cooperation which might be had from the interested companies.

Assuming that the cooperation would be as complete as that now received by the Bureau in its monthly petroleum statement, the quarterly report would provide currently accurate information regarding the trends in domestic and industrial consumption of natural gas and the growth in the geographical extent of its distribution. The Bureau has received requests for this type of information from marketers of solid and liquid fuels and manufacturers of heating and cooking equipment, as well as from those more directly associated with the natural gas industry.

If you have any suggestions regarding such a report or means whereby its preparation might be made possible, I would be very glad to hear from you.

E. B. SWANSON.

Bureau of Mines,
Washington, D. C.
April 24, 1929.

Thermal Treatment of Natural Gas

At the Columbus, Ohio, Meeting of the American Chemical Society, D. S. Chamberlin and E. B. Bloom had the following to say relative to the thermal treatment of Natural Gas.

Natural Gas was thermally treated in tubes of silica, steel, copper, iron, nickel, monel, and clay. Between temperatures of 500 to 900° C, the various tubes had different effects on converting methane to benzene, naphthalene, anthracene, acetylene, etc. All the above materials with the exception of nickel, gave yields of benzol varying from 0.03 to 0.3 gallons per thousand cu. ft. gas treated. Nickel catalysed methane causing a breakdown to carbon and hydrogen. The effect of temperature, surface, dilution, and other factors were studied. Various sized units are discussed, ranging from laboratory size apparatus to a semi-commercial installation. This work shows that carbon which is formed in the treatment tubes is responsible for the specific catalytic effect in changing natural gas to aromatic hydrocarbons. The CH residue is not necessary in the conversion but no doubt takes place in the polymerization to aromatics.

A Manual of Dry Box Purification

By Gilbert E. Seil, H. A. Heiligman and T. H. Clark

E. J. Lavino and Company, Philadelphia, Pa

(*Continued from page 42, May, 1929, American Gas Journal*)

Rate of Revivification

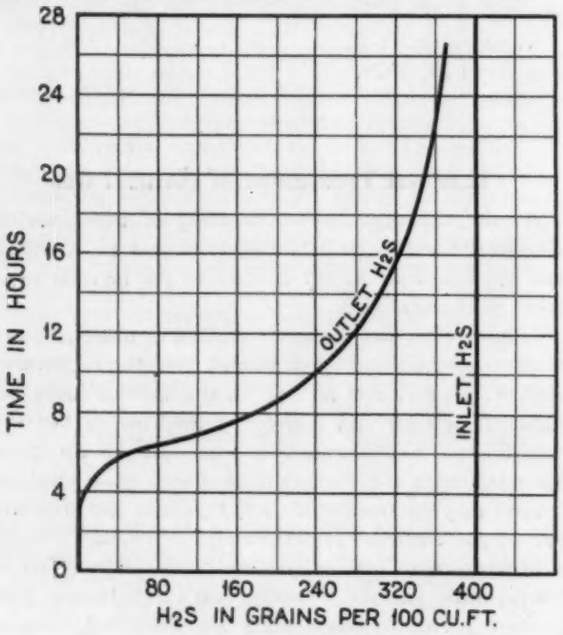
The rate of revivification of a gas purifying material may be measured in two ways. Air may be passed through the tube containing the fouled sponge at a definite rate, and by making oxygen determinations on the outlet gas, the time to completely revivify the material is determined. The material is completely revivified when it no longer takes oxygen from the air. This requires unusually accurate technique.

When revivification of an active material is carried out in the tube, the fouled material will gradually turn red. The time of revivification cannot be judged very accurately, but there is sufficient difference in different materials to give dependable results.

Interpretation of Results

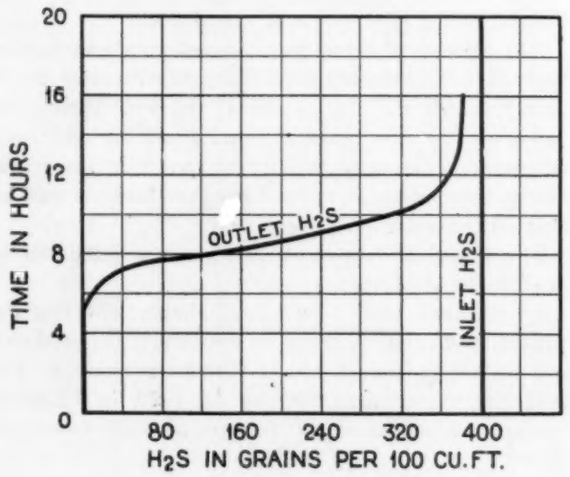
To compare gas purifying materials, plot the outlet H_2S results obtained on the *first* tube of each material against time. Tests must be made under identical conditions of gas flow, moisture content of the sponge, oxygen content of the gas and other variables. A comparison of the areas under the curves gives a definite measure of the purifying materials.

In this paper seven curves are shown for the purpose of comparison. Oxides No. 1, No. 2, No. 3 and No. 4 are commercial gas purifying materials which are being used in the industry today. Oxides No. 5 and No. 6 are materials which have been prepared on a semi-commercial scale for experimental purposes. Oxide No. 7 was on the market several years ago as a gas purifying material. (Detail test data in Appendix).



Efficiency Curve, Oxide No. 1
H_2O — 50.00 % Fe_2O_3 — 22.85 %

Foulings	*Kunberger*	*Seil*
1	14.80%	15.45%
2	14.52	14.02
3	12.95	13.94
4	12.75	13.75
Average	13.76%	14.28%



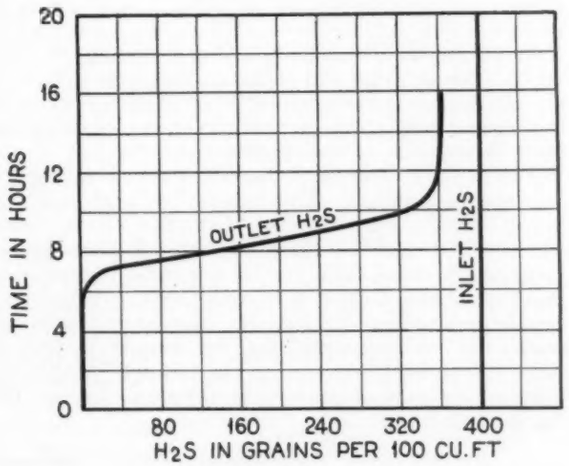
Efficiency Curve, Oxide No. 2
H_2O — 48.75% Fe_2O_3 — 29.56%

Foulings	*Kunberger*	*Seil*
1	17.26%	17.22%
2	16.29	17.06
3	16.75	16.62
4	17.67	16.87
Average	16.99%	16.94%

By superimposing the curves it is possible to compare the materials, under identical conditions, in respect to:

1. The lengths of time for which 100% efficiency is maintained.
2. The rate at which the efficiencies drop as the fouling continues.
3. The total amounts of H_2S removed.

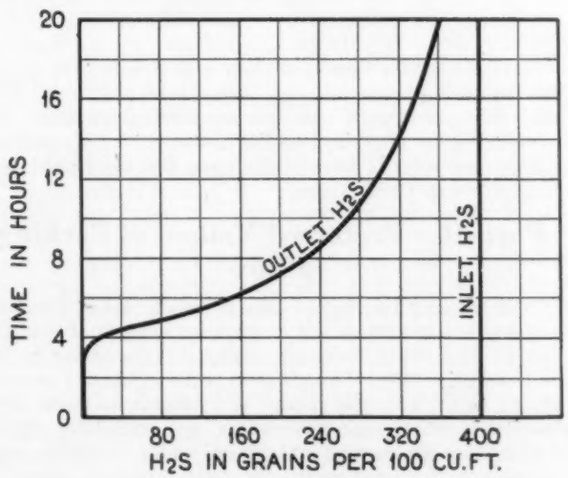
An important observation can be made while the test is in operation which indicates the power of the gas purifying material to remove all traces of H_2S. After the tube has been prepared for the test, it contains a column of sponge approximately 15 inches high. When the test is started the bottom of the column will turn black, and if the tube is properly packed, there will be a sharp even line between the black and red portions of the tube. This line will gradually rise, until finally the entire column is black. In keeping a record of a test,



Efficiency Curve, Oxide No. 3
H_2O — 50.00% Fe_2O_3 — 25.00%

Foulings	*Kunberger*	*Seil*
1	16.80%	16.71%
2	16.45	16.52
3	15.20	15.60
4	14.40	15.05
Average	15.71%	15.97%

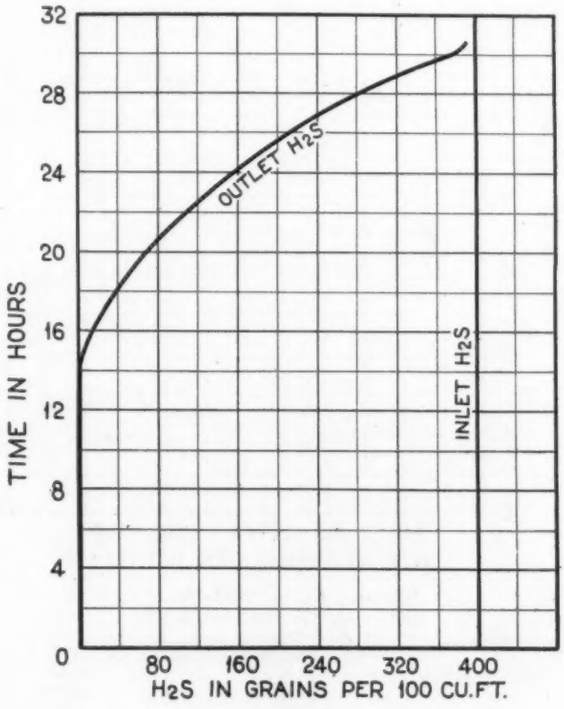
it is well to note the total height of the column, and the part which is fouled each hour. It will be noticed that when very active oxides are tested, no stain appears on the lead acetate paper until the entire column is black. When the average gas purifying material in use today is tested the first tests for H_2S appear when the column is about two-thirds fouled.



Efficiency Curve, Oxide No. 4
H_2O — 50.00% Fe_2O_3 — 22.21%

Foulings	*Kunberger*	*Seil*
1	12.82%	14.17%
2	12.88	13.55
3	11.49	13.13
4	10.24	12.30
Average	11.90%	13.29%

A study of the data and the curves on the seven oxides which are here given, demonstrates most conclusively the fallacy of evaluating a gas purifying material by a capacity test such as the Kunberger test given in the Gas Chemists Handbook. Oxides No. 1, No 2, No. 3 and No. 4 differ very little in capacity, efficiency and analysis, although Oxides No. 1 and No. 4 show a slight superiority to Oxides No. 2 and No. 3. Oxides No. 5 and No. 6 are very similar in capacity but differ appreciably in efficiency. Oxide No. 7 differs very little in analysis from Oxides No. 5 and No. 6, and it has a capacity by the Kunberger test a little better than Oxides No. 1, No. 2, No. 3 and No. 4, yet an efficiency test shows it is absolutely useless as a gas purifying material. Unfortunately at the time this material was on the market there was no test other than the Kunberger which could be applied to show its uselessness.



Efficiency Curve, Oxide No. 5
H_2O — 10.00% Fe_2O_3 — 73.53%

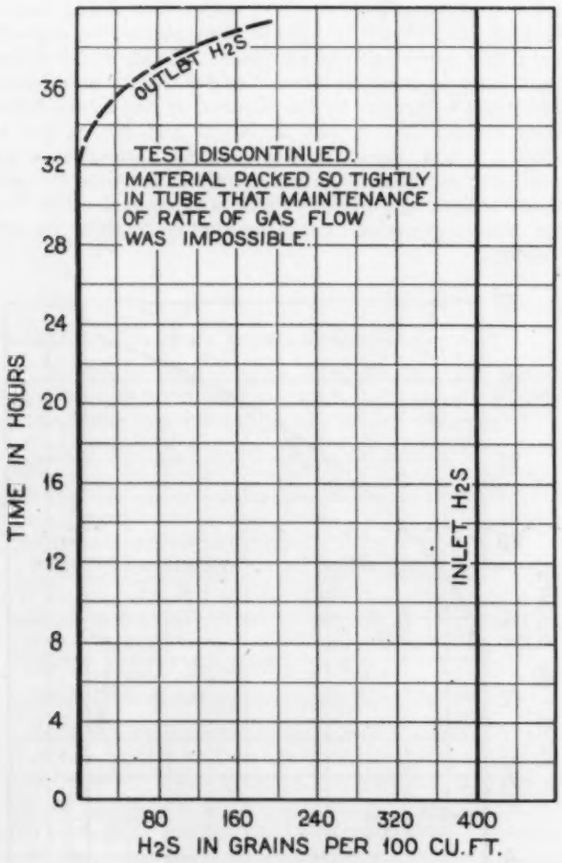
Foulings	*Kunberger*	*Seil*
1	30.45%	29.85%
2	42.90	43.76
3	45.86	45.84
4	42.12	43.27
Average	40.33%	40.68%

The removal of low percentages of H_2S by the sponge can be studied in the other tubes, as the gas passing through these tubes varies from zero to the maximum H_2S content of the gas.

Flexibility of the Apparatus

The apparatus described and the method of testing can be varied greatly, and made to meet the requirements of any plant. It may be set up in a plant so that different oxides can be tested using the foul gas direct from the main, under conditions identical with operating conditions. If the gas to be tested contains any tar, the operator must be careful to remove it, and this is best done by passing the gas first through a tube containing only sawdust. By regulating the conditions of the test, the operator is enabled to:

1. Compare sponges containing varying amounts of oxide.
2. Compare the same sponge under various gas rates.



Efficiency Curve, Oxide No. 6
H_2O — 10.00% Fe_2O_3 — 73.79%

Foulings	*Kurnberger*	*Seil*
1	30.17%	30.99%
2	43.59	44.01
3	46.12	45.99
4	40.97	41.65
Average	40.21%	40.66%

3. Compare the same sponge under varying temperature conditions.

4. Compare the same sponge with varying amounts of moisture.

5. Compare the same sponge with the same gas having varying air additions.

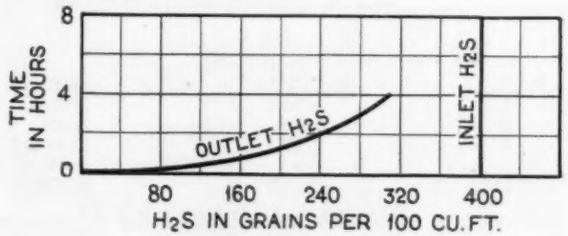
6. Determine whether partially spent material has sufficient activity and capacity for another fouling.

Part II—The Manufacture of Sponge

The amount of oxide to be used per bushel of sponge depends upon the H_2S content of the gas, and the number of bushels of sponge per 1000 cubic feet of gas purified per day. It has been found that 25 lbs. of Lavino Oxide per bushel of sponge for coal gas, containing approximately 400 grains of H_2S per 100 cubic feet, and 20 lbs. of Lavino Oxide per bushel of sponge for water gas, containing approximately 200 grains of H_2S per 100 cubic feet, are the most economical mixtures to use. In making these calculations a minimum of 5 bushels of sponge per 1000 cubic feet of gas per day was used. It is possible to operate efficiently with Lavino Oxide with as low as 1 bushel per 1000 cubic feet of gas per day, but under this ratio of sponge to gas flow the labor costs are appreciably increased, although the oxide cost per 1000 cubic feet of gas is the same.

From the data accumulated we find that the labor costs decrease as the ratio between the bushels of oxide to the gas flow increases until a critical point of 10 bushels per 1000 cubic feet per day is reached at which point the labor costs remain stationary.

The shavings used in the manufacture of sponge are an important factor. They should be large and thin, but at the same time of sufficient thickness to withstand the required load and handling. If they are planed from tough wood they can be relatively thinner than shavings obtained from soft wood, and will therefore, expose a larger surface to be impregnated with the oxide. It is also essential that too large a quantity of oxide is not used because the gas can only penetrate a definite thickness of oxide, and any oxide beyond this thickness is inert.



Efficiency Curve, Oxide No. 7
H_2O — 9.5% Fe_2O_3 — 79.62%

Foulings	*Kunberger*
1	29.1%
2	19.5
3	15.9
4	14.4
Average	19.7%

To produce the best sponge, it is desirable first to mix the purifying material with water to a paste and then add this paste with constant mechanical stirring, and preferably by spraying, to the shavings. This method yields most evenly coated shavings, free of lumps, and ideal for gas purification.

Part III—Preferred Method of Packing a Box

Gas passing through a box naturally takes the path of least resistance, and it is therefore essential that the box be uniformly packed to eliminate channeling as far as possible. After enough sponge for a 12 inch layer is placed in the box, the sponge is forked in an even layer over the entire exposed surface and carefully raked. Enough for another 12 inch layer is added and the same procedure followed until the box is filled. Care is taken that the men stand on planks while forking and raking to prevent uneven packing. In accordance with the usual practice the sponge should be carefully tamped for a distance of six inches from all metal surfaces.

Part IV—General Plant Practice

Temperature Measurements and What They Mean

Purifying boxes work most efficiently at a temperature above 80° F. and it is preferable to keep the temperature between 85°F. and 110°F. In quipping a dry box there should be two recording thermometers reading on the same chart, one at the gas inlet and the other at the gas outlet. As they record on the same chart the con-

vergence or divergence of the temperature curves immediately indicates whether the reaction is causing the box to heat up or whether the flow of gas and the evaporation of the water is causing a decrease in the temperature. This temperature measurement should be taken on each box separately and it is good practice to have a steam inlet to each box at the point where the gas enters, so that the temperature of the gas can be definitely and carefully regulated.

Significance of Humidity Measurements

The measurement of the gas humidity as it enters and as it leaves the box is a most important record. Inasmuch as the carrying capacity of a gas for water varies directly with the temperature it is essential that the gas does not carry off any more water from the box than it brings to the box. If the gas carries more water from a box than it brings to it, the sponge will of necessity dry out, and as will be pointed out in the next paragraph, dry sponge cannot purify gas as well as wet sponge. The humidity records will give the temperature measurements which are required in the preceding paragraph.

The Function of Water

Although sponge used in dry box purification is always introduced in a moist state and should be kept moist, it is not generally known that when the moisture content drops to a low point the activity of the sponge falls appreciably, and the sponge does not regain its maximum activity until it is re-moistened. The function of the water in the box is to act as a differential solvent for the H_2S and to hold it for a sufficient time for the oxide to react with it. The presence of alkalies in the sponge increases the selective action of the water as a solvent for the H_2S.

There are two methods by which water can be added to the box as desired. Steam is sometimes put into the box with the entering gases. A very satisfactory arrangement is to have a spray which goes completely around the box above each layer of oxide, and by means of which the sponge can be moistened whenever desired.

In consideration of the function of the water it is evident that with a high percentage of water in the sponge the rate of flow of gas through the sponge can be much greater than in dry sponge. This is a very important relationship because every reaction takes a definite time for its completion, and if the H_2S does not have sufficient time to react with the iron, the iron cannot remove it from the gas.

The Necessity of a Potential Alkali

In all purification there is a tendency for the sulphur to oxidize to sulphuric acid and as an acid box is not a good purifying medium the presence of a potential alkali in the oxide is essential for neutralization of the acid formed. With Lavino Oxide the acidification of a box is almost, if not actually, impossible. There is enough easily available alkalinity in Lavino Oxide to neutralize the small amount of acid usually formed and sufficient total alkali to take care of an unusually large amount of acid.

Effect of Poor Tar Removal

As have been brought out, H_2S removal by dry box purification is a surface phenomenon and inasmuch as the action which takes place in the box depends on the surface contact between the Iron Oxide and the H_2S, if the surface of the iron oxide is covered with tar, oil or napthalene, the iron so covered cannot react with the H_2S. Under normal operating conditions trouble of this character is not experienced, but if for any reason tar and oil are entering the boxes steps should be taken to correct this condition by the use of a shavings scrubber or other means.

Revivification

By revivification is meant oxidation of the ferric sulphide to ferric oxide and sulphur. This is accomplished by bringing the fouled material into contact with air, using any one of several well known methods. In its usual sense revivification means only that oxidation which takes place when the sponge is not in contact with illuminating gas. Catalytic oxidation which is equivalent to the revivification of Fe_2O_3, is actually taking place while the purifying material is in contact with gas which contains small amounts of available oxygen as previously explained.

Fig. 2

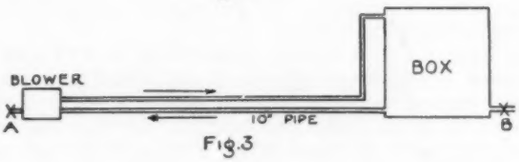


Fig. 3

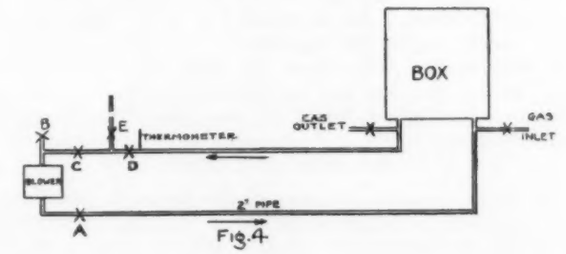


Fig. 4

The method of revivification usually depends on plant conditions. Where space is available, the authors favor revivification by removal from the box, allowing the fouled sponge to remain exposed to the air until the oxidation of the ferric sulphide is complete. In this way all lumps of sponge which have formed in the box during fouling are broken up before the sponge is replaced, and danger of channeling from this source is almost completely eliminated.

Where it is preferred to revivify the fouled sponge without removal from the box, several methods are used. Three methods are described:

Method No. 1

This method (see fig. 2) consists of blowing air, under pressure, through the box. The blower is started with valve A partially closed, allowing enough air to leak out to keep the pressure constant at five pounds. If the air pressure goes above five pounds, or if the temperature rises above 115° F., the blower is shut off until conditions are corrected. By this method revivification is taking place in low concentrations of oxygen, thus reducing the possibility of overheating, and the air is forced to penetrate and revivify all the lumps in the box.

Method No. 2

This method (see fig. 3) consists of circulating air through the box by means of a blower. Valve A is partially opened to start and an analysis of the gas is made at valve B. Valve A is gradually opened until the gas being circulated through the box contains 5% oxygen. Care is taken to keep the oxygen from exceeding 5%, and to keep the box temperature below 115° F. Should either of these limits be exceeded valve A is partially or entirely closed until conditions are corrected.

Gas samples are taken at regular intervals at valve B in order that a careful check can be kept on the amount of oxygen in the gas. The CO_2 can also be determined on these samples, although it is not essential. The CO_2 should start at about 2% and show a gradual decline through the revivification.

It is good practice to have the box equipped with sprays, such as those described under "The Function of Water," so that the sponge can be uniformly moistened should it dry out during revivification.

Method No. 3

This method (see fig. 4) is similar to Method No. 2, in that at the beginning revivification is accomplished by circulating the gas with a slight excess of oxygen. The revivification is completed by passing air through the box and discharging into the air.

The blower is started with valves A, C, and D open, and valves B and E closed. Valves B and E are then partially opened, and valve C is partially closed. The thermometer is carefully watched for any increase in temperature, and if there is no rise in temperature, valves B and E are gradually opened, and valve C is gradually closed. Air is now being blown through the box, and is discharged into the air through the valve E. By keeping the pressure on the lines between six and ten inches, the box can be thoroughly blown. As in the case of Method No. 2, the box should be equipped with sprays.

Rotation of Boxes

In a few plants rotation of the boxes is practiced, with the belief that gas very low in H_2S and containing a small percentage of oxygen will revivify a badly fouled box. In reality the opposite is true, and often a gas which enters a badly fouled box clean, will pick up 10 to 20 grains of H_2S, and will leave the box fouled.

It is the opinion of the authors that rotation is not good practice, but that the box most badly fouled should be first in the line, and that the cleanest box should always be used as a catch box. When a box is completely fouled, it is removed from the line and revivified, and a clean box inserted into the line *as a catch box*.

Conclusion

Although many papers have been published on various phases of dry box purification, the individual papers covered single phases of the subject but none of them considered purification in all its aspects. This thought has been carefully followed throughout this paper which we believe has thoroughly covered the problem of purification as a whole, stressing each individual operation from the evaluation of the gas purifying material before purchase, through every step of its use.

After a very careful survey of our laboratory notes and actual performance, it has been concluded that the activity test described herein is the most accurate laboratory method of evaluating an oxide for plant practice. Many materials have been examined with unusually large capacity values, determined both by the Kunberger and the Seil methods, which showed practically no activity when subjected to this test. These oxides do not remove traces of H_2S from foul gas for an appreciable length of time. On the other hand many other materials have been examined with very low capacity values, but with very high activity values. These materials in practice always purify gas completely for an unusually long period of time, because the Fe_2S_3 formed acts catalytically to cause a direct reaction between the H_2S and the added oxygen.

Our laboratory after a two years trial has adopted the Seil activity test, described in this paper, as the standard for determining activities, and the Seil modification of the Kunberger method, that is the determination of the Fe_2O_3 to H_2S ratio, as the standard for determining capacities. This method of determining capacities has the advantage of a direct determination of the iron to sulphur ratio whereas the method described in the Gas Chemists Handbook is an indirect method. Any loss of gas such as CO_2 decreases the percentage fouling while the absorption of any gas, or any change in valence, causes variation in the percentage fouling due to materials other than H_2S.

Appendix

Test No. 1 **Date 3/18/29**

Material—Oxide No. 1

H_2O—50.00% Fe_2O_3—22.85%

Foulings	Kunberger	Seil
1	14.80%	15.45%
2	14.52%	14.02%
3	12.95%	13.94%
4	12.75%	13.75%
Average	13.76%	14.28%

Height of sponge in tube—17"

Time hours elapsed	Black ring from bottom of tube	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	0"	410	0	0
1	3"	410	0	8.8
2	6"	400	0	17.2
3	8½"	400	Stain	26.8
4	12"	390	Stain	36.0
5	15"	400	26	44.9
6	17"	390	71	53.9
7		390	140	63.0
8		390	180	72.2
9		400	210	81.2
10		390	240	90.2
11		400	260	99.9
12		390	280	109.0
13		380	290	117.9
14		380	300	126.0
15		420	320	134.8
16		410	330	143.6
17		420	340	152.4
18		410	340	161.3
19		400	340	170.3
20		390	350	179.4
21		400	350	188.2
22		410	360	197.0
23		380	360	206.1
24		400	360	215.1
25		400	360	224.2
26		400	370	233.7

Test No. 2 **Date 3/18/29**

Material—Oxide No. 2

H_2O—48.75% Fe_2O_3—29.56%

Foulings	Kunberger	Seil
1	17.26%	17.22%
2	16.29%	17.06%

Foulings	Kunberger	Seil
3	16.75%	16.62%
4	17.67 %	16.87%
Average	16.99%	16.94%

Height of sponge in tube 15¼"

Time hours elapsed	Black ring from bottom of tube	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	0"	400	0	0
1	3½"	400	0	9.7
2	6"	400	0	18.1
3	8"	380	0	27.4
4	10¾"	420	0	36.8
5	13½"	420	0	45.5
6	15¼"	420	8	55.2
7		400	28	64.4
8		410	130	73.5
9		400	230	81.3
10		390	320	90.1
11		400	360	99.5
12		410	370	108.5
13		410	380	117.4
14		410	380	126.4
15		400	380	135.9
16		400	380	144.5

Test No. 3 **Date 3/20/29**

Material—Oxide No. 3

H_2O—50.00% Fe_2O_3—25.00%

Foulings	Kunberger	Seil
1	16.80%	16.71%
2	16.45%	16.52%
3	15.20%	15.60%
4	14.40%	15.05%
Average	15.71%	15.97%

Height of sponge in tube 15"

Time hours elapsed	Black ring from bottom of tube	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	0"	410	0	0
1	4"	400	0	9.5
2	7"	440	0	18.0
3	9"	410	0	27.3
4	10½"	380	0	36.5
5	12"	400	0	45.1
6	14"	400	Stain	54.9
7	15"	400	20	63.8
8		380	160	72.9
9		410	220	81.4
10		410	320	90.3
11		380	340	99.0
12		400	350	108.1
13		390	360	116.9
14		400	360	125.9
15		410	360	135.1
16		410	360	143.8

Test No. 4 **Date 3/18/29**

Material—Oxide No. 4

H_2O—50.00% Fe_2O_3—22.21%

Foulings	Kunberger	Seil
1	12.82%	14.17%
2	12.88%	13.55%
3	11.47%	13.13%
4	10.25%	12.30%
Average	11.90%	13.29%

Height of sponge in tube—14½"

Time hours elapsed	Black ring from bottom of tube	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	0"	420	0	0
1	4¾"	400	0	8.9
2	7½"	410	0	17.9
3	11"	400	0	27.1
4	14"	400	20	36.2
5	14½"	420	100	45.3
6		400	150	54.1
7		400	200	62.9
8		400	220	71.9
9		400	250	81.0
10		400	270	89.8
11		410	290	98.9
12		410	300	108.0
13		410	310	116.7
14		410	320	125.8
15		410	330	136.6
16		410	330	145.7
17		410	330	154.3
18		410	350	163 3
19		410	360	172.0
20		410	360	181.5

Test No. 5 **Date 3/13/29**

Material—Oxide No. 5

H_2O—10.00% Fe_2O_3—73.53%

Foulings	Kunberger	Seil
1	30.45%	29.85%
2	42.90%	43.76%
3	45.86%	45.84%
4	42.12%	43.27%
Average	40.33%	40.68%

Height of sponge in tube 14"

Time hours elapsed	Black ring from bottom of tube	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	0"	420	0	0
1	3"	420	0	8.8
2	4½"	420	0	17.9
3	6"	420	0	27.1
4	7"	420	0	35.9
5	7½"	410	0	44.8
6	8¼"	400	0	54.0
7	9½"	410	0	62.8
8	9½"	400	0	72.1
9	9¾"	400	0	80.9
10	10½"	410	0	90.5
11	11"	400	0	99.1
12	11½"	400	0	109 4
13	12½"	410	Stain	117.9
14	13"	400	Stain	126 9
15	14"	400	5	135.4
16		400	8	144.3
17		400	30	153.1
18		400	40	162.0
19		380	60	171.3
20		380	80	180.1
21		400	100	189.4
22		380	120	198 0
23		400	140	207.6
24		400	160	216.4
25		420	190	225.1
26		420	220	233.9
27		410	240	243.1
28		420	280	241.9
29		410	320	250 5
30		400	380	259 2
31		400	390	277.6

Test No. 6 **Date 3/13/29**

Material—Oxide No. 6

H_2O—10.00% Fe_2O_3—73.79%

Foulings	Kunberger	Seil
1	30.17%	30.99%
2	43.59%	44.01%
3	46.12%	45.99%
4	40.97%	41.65%
Average	40.21%	40.66%

Height of sponge in tube 15"

Time hours elapsed	Black ring from bottom of tube	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	0"	0	0	0
1	3"	410	0	8.2
2	4"	410	0	17.6
3	4½"	400	0	27.0
4	5½"	400	0	36.1
5	6"	380	0	45.5
6	6¼"	400	0	54.1
7	7"	400	0	62.8
8	7½"	390	0	70.9
9	8"	390	0	79.2
10	8½"	390	0	88.3
11	8¾"	400	0	96.4
12	8⅞"	410	0	105.4
13	9"	400	0	114.8
14	9⅛"	390	0	123.6
15	9¼"	410	0	133.6
16	9½"	400	0	143.5
17	10"	410	0	153.0
18	10¼"	400	0	161.9
19	10½"	410	0	170.4
20	10¾"	400	0	179.4
21	11"	410	0	188.2
22	11¼"	410	0	197.0
23	11¾"	410	0	205.7
24	12¼"	400	0	214.1
25	12½"	400	0	222.1
26	12¾"	400	0	230.1
27	13¼"	410	0	237.6
28	13½"	400	0	244.7
29	14"	400	0	251.7
30	14½"	400	0	258.0
31	15"	400	0	264.1
32	15½"	400	Stain	270.3

Test No. 7 **Date 3/28/28**

Material—Oxide No. 7

H_2O—9.5% Fe_2O_3—79.62%

Foulings	Kunberger
1	29.1
2	19.5
3	15.9
4	14.4
Average	19.7

Height of sponge In tube 16"

Time hours elapsed	Inlet H_2S grs. per 100 cu. ft.	Outlet H_2S grs. per 100 cu. ft.	Meter reading cu. ft.
0	410	0	0
1	390	200	8.8
2	390	250	17.9
3	390	290	26.7
4	390	310	44.8

Remarks:—Stain appeared on lead acetate paper 30 seconds after start of test. There was no sharp line between the fouled and unfouled portions of the sponge.

H_2O, Fe_2O_3 and foulings determined by Chemical Service Laboratories, Philadelphia, Pa.

The authors desire to express their thanks to Mr. A. J. Wallace, Manager, Mineral Dept., E. J. Lavino Co., for his able assistance in the preparation of the paper and his constructive criticism.

Determination of Sulphur in Flue Gases

It is well known that in the burning of coal the larger part of its sulphur content passes out with the flue gases and only a small percentage is found in the ashes and clinker. The determination of the sulphur content of flue gases involves difficulties both in the sampling and in the chemical technique. The more general practice is to sample the fuel-bed refuse, determine its sulphur content and estimate that going to the stack by difference. It is necessary in some investigations, however, to measure the sulphur in the flue gases directly, and it is therefore desirable to develop a technique and to determine its probable accuracy.

An investigation has been made at the Pittsburgh Experiment Station of the United States Bureau of Mines, Department of Commerce, for Pittsburgh coal burned in the furnace of a small power boiler. Measurements were made for 8-hour periods of the total sulphur in the refuse, in the gases beyond the bridge wall, and in the flue gases in the attempt to account for the total sulphur in the coal. With the greatest care the total sulphur as measured always average less than that in the coal. From 3.2 to 4 per cent of the total sulphur was found in the refuse; from 82.2 to 93.3 per cent in the gases at the bridge wall; and from 75.4 to 83.4 per cent in the flue gases. Thus at the bridge wall the percentage of sulphur unaccounted for ran from 3.5 to 13.8 per cent, while in the stack there was missing from 12.6 to 21.4 per cent.

The investigation showed that great care must be taken in the sampling and in the analytical technique or the sulphur so measured may be much too low. This investigation did not determine the form in which the sulphur existed in the gases or in the refuse.

Enrichment of Water Gas with Synthetic Hydrocarbons

In the production of manufactured gas, or city gas, by the water-gas process, the practice has been to enrich or carburet the water gas by the use of gas oil to the approved city standard, namely, to 450 to 560 B.t.u. per cubic foot. Engineers in the gas industry are looking to the future when, it is anticipated, the available oils will be too expensive for such use and accordingly have focused considerable attention to the possibilities in processes for making suitable synthetic hydrocarbon enrichers from water gas as a raw material.

Some attention has recently been given to certain phases of the general problem by the United States Bureau of Mines, Department of Commerce, at the Pittsburgh Experiment Station. The reactions whereby synthetic hydrocarbons are produced from water gas occur normally at so slow a rate that they would not be commercially useful were it not for the fact that catalysts have been found which at temperatures of 520 to 750° F. materially increase the reaction velocity. It is necessary, in the use of such materials, to pass the water gas into intimate contact with a mass of the catalytic material. The heat evolved by the chemical reactions is liberated at the surface of the catalyst which, unfortunately, is sensitive to rise in temperature, and its activity is materially decreased upon overheating. Accordingly, means must be provided for dissipating this heat as fast as it is generated. Studies have been made of the practicability of using known means and methods of heat transfer in this process, both for design and cost, and also for reducing the loss of heat to a minimum. Such studies are necessary to determine the possible future relation of such processes to the manufacture of city gas.

Attendance at the last cooking matinee of the week

Glorifying Gas

Wherein is shown how customer good-will and sales can be increased by making gas stylish.

By John H. Hartog

Manager Sales and Advertising Dept., Portland Gas & Coke Company, Portland, Oregon.

COOKING schools have been given so often that the novelty is off and it seemed to us, in conducting a recent demonstration, that some other title might be substituted which would be more of a drawing-card.

On account of our new location we had two things in mind: first, to get people to visit our store which is away from the shopping district and secondly, to have a chance to talk heart to heart to large audiences of interested women about the advantages of Gas for cooking, refrigerating and heating.

Instead of engaging the Municipal Auditorium where the electric annual cooking school is held and where, with the most liberal amount of newspaper support and publicity as well as valuable door-prizes, the total attendance averages about 1200, which makes the large Auditorium seem bare and lacking sociability and coziness, we decided to use our beautiful display-room.

The result was more than gratifying, because in the first place every seat was taken at every one of the twelve sessions and this in itself created an atmosphere of success and interest. Secondly, we had the pleasure of entertaining the visitors in our own home. Thirdly, our hall was not big enough to make it impossible to reach them all with our voices, although we did use amplifiers to easily reach the balcony. Last, but not least, the impression these vast audiences made upon the passers-by on the street, was in itself a boost for Gas and for the lectures. Many a time people were seen standing for more than an hour at our windows watching the audiences or the Chef who came here especially from the famous Palace Hotel, San Francisco. While they could see him stir things up, they could not hear a word he said, but could only judge from the faces of the audience how interesting he was. Evenings they would crowd around the windows where they could see him and stand there "licking their chops" as it were. We purposely did not put any amplifiers on the outside for fear that our large plate-glass windows might be crushed in.

1—Photo taken by the Oregon Journal, when, to their amazement, the editor came over at 1 o'clock an hour before the opening of the first Matinee and found that the doors had been closed. The ushers can be seen inside the doors guarding them against the entrance of any more, as even the aisles were packed. The people seen standing in the lobby were looking into the display-room apparently fascinated at the unusual sight.

2—An interesting study, especially of the man who is "tacking" like a sail-boat to find his way through the women buffeting his progress. This was taken at about 1 o'clock the opening day and most of the women shown in the picture are those coming out of the building when they found there were no seats to be had. Undoubtedly most of them came back in the evening or else were on hand earlier next day.

3—The chief lecturer and her three assistant lecturers, from left to right: Victoria Warner, Louise Palmer Weber, Elizabeth Reger and Grace Anderson.

4—The staff. Considering that the third gentleman from the left, Mr. Benson, had four men under him to do the actual hard work and the second from the right, Mr. Gray had some 15 salesmen at his beck-and-call to act as ushers, it is easy to understand how the details could be worked out so perfectly that the entire affair went off without a hitch and was the subject of enthusiastic praise from all who attended.

For one week in advance of the affair the Oregon Journal gave the lectures front-page publicity which was enlarged upon in the Sunday issue just prior to the opening day.

The Word Soirée Was a Novelty

One difficult task was to get away from the stale title "Cooking School" and to find something that would be more attractive. Many women resent the idea that they have to go to school. From a San Francisco effort we copied the word "Matinées" and then added "Soirées." As the word soirée is one which is not nearly so commonly used as matinée, this title in itself created discussion as to what a "soirée" really was and somehow it caught the popular fancy. Everybody wanted to show how well they could pronounce this new word.

While we had no doubt whatsoever about the success of the Matinées, we were somewhat anxious about the novelty of giving Soirées, but while the Matinées were a jam, the Soirées were also crowded, though not over-crowded like the afternoon affairs were. In no instance however was there an empty seat and even at the Soirées there were always people standing up. It proved that many will come evenings who cannot get away in the daytime or who wish to bring their husbands.

To show how interesting and attractive an affair like this can be made, we need only state that people commenced to arrive as early as 10 a.m. for the 2 p.m. lecture and after the Matinée was over at 4 o'clock and the crowd had been to the refreshment booths, inspected the Gas appliances and got out before closing time (5:30) some of the women brought their supper along with them so as to be on time for the evening lecture which did not start until 8 p.m. and scores were clamoring for admission before the doors were opened at 6:30.

The Oregon Journal was so astounded at this that they snapped and published a photograph of four women who had brought along a deck of cards and improvised a card table on their knees to spend the hours before the performance in playing bridge.

Chef Philipp Roemer and Louise Palmer Weber, known as radio broadcaster, dietitian and quite a favorite with the women, Victoria Warner of the Tappan Stove Company and our two Home Demonstrators, Elizabeth Reger and Grace Anderson, all immaculate in white, gave the stage an atmosphere of dignity and carefully thought-out planning which many remarked upon.

Kept the Audience Spell-Bound

Instead of doing a lot of preparing in front of the audience, with women yawning while the cook is stirring, mixing or beating up something and trying to

talk in between times to keep the audience awake, we decided that women were not interestd in seeing the beating up of eggs or the mixing of batter. Every one of the recipes was tried out in our basement kitchen-laboratory and things that were not interesting to our audiences were done beforehand, so that the lecturer could talk without being disturbed and yet show the ultimate results.

The Chef, on the other hand, demonstrated many of his dishes which, in his case, made them all the more interesting; as, for instance, how to bone a squab chicken and then stuff it, pin it together and broil it, and the amazement on the faces was interesting when a few minutes later the Chef would turn around and exhibit what the Gas oven had accomplished for him in so short a time.

The Speed of Gas Surprised All

It certainly was an effective demonstration of the speed of Gas as compared with electricity and he always took great delight in telling about the seventeen units in the enormous Palace Hotel kitchens—all Gas.

In order to get the names and addresses of everyone attending, one valuable prize was offered for each meeting, making twelve in all for the week. No prizes of small packages such as given at country cooking classes, like pancake flour, salt, cake flour, breakfast food, etc., which litter people up with cumbersome packages which are hardly worth carrying about the rest of the day, were permitted.

When the affair was over we had a total of more than 12,000 registration cards, giving us more than 6,000 names of interested friends.

In order to tie up with other range dealers we allowed them to exhibit one of their ranges on the Mezzanine floor among the refreshment booths, as can faintly be seen in the photograph where the Buck's, Spark and other ranges can be noticed.

On the platform the display was a veritable delight, thanks to the good taste and experience of Mrs. Weber who insisted on an ensemble all in green shades, even the kitchen utensils, dish-towels and glassware, while the two beautiful Smooth-tops and the one Tappan In-So-Top were in green and cream and the refrigerators were snow-white, but the Hoosier Cabinet trimmed in green.

The affair was such an outstanding success that it was the "talk of the town" and the fact that it was so, is due mainly to the thorough manner in which it had been organized. Meeting after meeting, for weeks in advance, was held to thrash out every possible detail.

Did Sales Result?

Aside from the making of thousands of friends and getting our message over day after day to thousands of interested and really enthusiastic listeners, there is the question which the hard-headed business man immediately asks: Did it make any sales? As a rule the enthusiastic manager of such an effort would say "No, of course not, but think of the prospects!" In this case he did not have to make an alibi as many sales followed and kept on resulting, directly traceable to the undertaking.

The amount of advertising indulged in may interest Sales Managers. We guaranteed half of the 15 pages which the newspaper desired. As to the expense involved, anyone really interested can find out by writing us, but as this is a matter of more or less personal nature it is not published broadcast. Suffice it to say however, that we are already looking forward to a successful repetition next year and even at this early date —eleven months ahead—are taking advance steps toward securing its success.

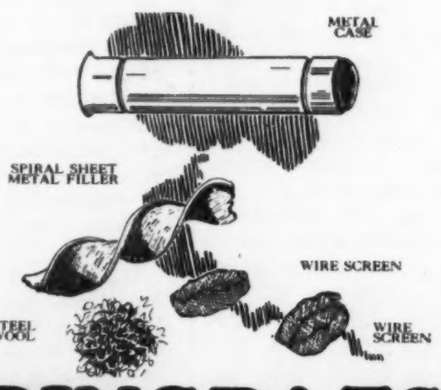
And now, aside from all the above, there is one additional fact, by no means the least and that is the new enthusiasm, the bubbling-over kind, which pervaded the entire sales floor from its daily contact with these thousands of happy people and the face-to-face encounter with real success.

Who could listen to the glorification of Gas, without being proud of being in that industry? Who could behold the beautiful stage-setting without again falling in love with the appliances we sell?

It took everybody out of the rut, if perhaps they were in one more or less, and the accumulating discouraging knocks which one gets day after day and eventually might undermine one's faith, were blown away as the dust from a threshing-floor.

Gas came into its own. Gas was glorified. Gas was once more on the throne taking a backseat for none. And the salesmen's new enthusiasm shows itself in the daily sales since the affair, as they exceed those of the same period last year.

The most outstanding instance was the case of a builder, antagonistic to Gas. The type that knew better and wouldn't even listen. His wife attended the Journal affair and became so converted to Gas cooking and Gas Refrigerators that she put up a job on friend husband, inviting our apartment-house man at an hour when she knew hubby would be in, secured him an audience, introduced the subject, converted her husband and . . . . just as I penned this closing paragraph, in came the joyful news that our representative had closed the order for Electrolux Gas Refrigerators.



"DINGBATS"

THERE is being sold through the mails and by house-to-house canvassers a device which is purported to "reduce gas bills." This device is a metal tube containing a piece of spiral sheet metal, a very fine wire screen at each end and with a bunch of steel wool inside the wire screen obviously constructed so as to impede the flow of gas.

This device is inserted in the house piping as a "gas saver." It does "save gas" for it prevents the full volume of gas from flowing through the house pipes and into the gas burning appliances.

The same results can be accomplished by turning the gas down at the burner—and without introducing anything into your gas piping that does nothing but obstruct the flow of gas and reduce the pressure.

This advertisement is being published in the interest of housewives who may be approached by plausible salesmen to purchase this so-called "gas saver." This device is of no value to any home. If you want to burn less gas, this can be accomplished without buying this so-called "gas saving device," by turning your burners low, AND FULL GAS PRESSURE WILL BE AVAILABLE WHEN YOU WANT IT.

New Orleans Public Service Inc.

Good Customer Protection

ONE YEAR OF HOME SERVICE WORK

By Karen Hadoes
Home Service Director, Equitable Gas Co.

TO the public utility corporation, nothing is quite so important as public confidence. Executives yearn for it, department heads work for it and an army of employees is under constant admonition to cultivate it. The mere reiteration of their attitude, however, is not convincing to the world at large. How then may not only the company clientele, but the possible patronage of Mr. and Mrs. General Public be convinced? We think we have found a potential source of power for the erection of a structure of confidence on which we and the public may work in coordination and cooperation not alone to a mutual benefit and better understanding, but also in the interest of a general community welfare. It is our home service department.

We aim first at making life an easier and a simpler process. We seek to show the housewife how she, if she must, and her servants if she has them, can do the work of housekeeping in the easiest, cleanest and least troublesome manner. We hope to make the male of the species more comfortable in his home. The preparation and serving of home meals we try to make not a task but a pastime. If we can show the public that these things can be done, surely it should inspire confidence in us; and once we have public confidence we have gone a long way toward our goal. It means conveying to the public a practical assortment of household hints, cooking recipes, furniture arrangements, interior decoration, sanitary devices, and a host of suggestions pertaining not only to our products but to every article that enters into daily life.

Our home service department at its inception was wisely devised so that those who sought its advice found no need of coming into contact with the business operation of the corporate affair. We call it Utility Hall. How it has functioned during the past year constitutes an interesting narrative.

Statistics are the nudities of literature, only interesting when sensational in character or viewed by a critical eye. To the technician these figures may not be uninteresting. In its first year over seven thousand one hundred people attended our two hundred auditorium lectures and demonstrations in cooking, interior decoration and lamp shade making. Nearly forty thousand visitors have called at Utility Hall. Over twenty thousand recipes went out to the public during the year. Home demonstrations in which our inspectors have examined gas ranges numbered about three thousand. We got requests in person, by telephone and mail, we demonstrated in our own quarters, at the home and to outside groups. To understand our work, its extent and the systematic lines which we follow out, a description of Utility Hall is necessary. We have constructed within it a model home, as nearly the ideal of all that

"The hand that rocks the cradle is the hand that rules the world." This might be paraphrased to state that the same hand determines largely the extent to which gas is used in the home.

If our company can have the good will of the women in the homes and if it can persuade them that they should enjoy increasingly the benefits to be derived from the use of gas and gas appliances, then the future of residential use of gas is secure.

There is no better approach to the women of a community than through the personnel of a Home Service Department. As a medium of successful utility contact with women, nothing can excel the trained Home Service Worker.

Home Service is far more than mere cooking demonstrations or courses on lighting. It can and should be the means of bringing to every woman in a community a realization of the value to her of the use of gas. It can and should be the Gas Company's best influence upon women from high school or Girl Scout age to the grandmothers and even great grandmothers.

Home Service Departments now are valuable agencies for good will and for better revenues. I venture that the future will find them indispensable.—Geo. E. Whitwell.

is attractive in home life as we are able to conceive. It is of practical size and contains a hall, living room, dinette, kitchen, bedroom, bath, laundry, play room, and furnace room. It gives ample opportunity for full demonstration of lighting, heating and decorative features, in the use of gas, electricity and gas and electrical appliances. To many people it is an education simply to go through this home and see how completely and conveniently a house can be equipped and the cost still kept within the means of the average person. To many others it is a source of valuable suggestions in the arrangement of their own home where they already have the conveniencies installed. There is no doubt that this feature of Utility Hall has brought us many visitors during the past year. It is made attractively interesting enough to bring those who come merely out of curiosity as well as persons seeking practical assistance and information.

An Adequate Auditorium

There is an auditorium in which our classes are held. It has a capacity of some two hundred who can be comfortably seated. A fully equipped stage upon which the demonstrations are offered and from which the classes are addressed provides ample opportunity for all who come to keep in close contact with the demonstrator and observe her carefully. The stage is set up as a kitchen, containing all the equipment and appliances that a modern kitchen should have. Adequate lighting is provided from above the stage. We have found that the classes held in this hall and the demonstrations conducted there have provided the essential contact with the consumer that is sought to be effected more than any other phase of our activities. Of the seven thousand people who attended during the last year, many have become constant patrons. Some of them interest themselves only in the cooking, others in the interior decorating, and still others in the designing and making of lamp shades. Many of them, however, are interested in all the various activities. The classes begin in September. When one series of lectures is completed in a course of from eight to twelve weeks, another subject is taken up and so the time is consumed until the following June, when the classes are suspended for the summer months. Women are urged to bring their personal problems with them and present them before the class for discussion. In the beginning it was sometimes difficult to overcome the embarrassment of the audience and discussions were slow to start, but in the last year they have become more popular and are frequently active. These discussions are as useful to the staff as to the class, for they help to show the customer's point of view and create opportunities to clear up causes of dissatisfaction, both real and fancied, and to eliminate what otherwise might be sources of public prejudice. Of course, all these lectures and demonstrations are presented free of any charge or fee; and to create a social atmosphere and add interest to the gatherings, tea with cake, cookies or sandwiches is served. There are always some requests for the recipes of whatever we serve with tea.

A Generous Policy

The auditorium is placed at the disposal of outside groups as well. The regular work of Utility Hall does not occupy all the time in the auditorium; and clubs, scout organizations, associations and similar assemblies are given the opportunity of using it. They may provide their own demonstrations upon these occasions, but demonstrations and entertainments by our own department are frequently given to such groups; and this demand upon our services is growing. On the average, the auditorium is so occupied about five nights a week.

In addition to the lectures and demonstrations in the auditorium, a similar service is rendered outside Utility Hall. This is provided upon request, and we have invited outside groups to use our services in this respect with gratifying results. The topic or demonstration is usually selected by the organization that requests the service. Utility Hall is always willing, however, to provide a topic for discussion or demonstration.

Radio Does Its Bit

With the advent of the radio, we found a most welcome and we believe valuable accessory to the work of Utility Hall. From the microphone of a nearby station, it has been a happy diversion to give weekly broadcasts to an unseen audience of numbers impossible to estimate. Every Friday for the last three months of last year the radio cooking school was put on the air. The fan mail is a more or less accurate index of the plan's effectiveness, but not conclusive. It has been growing slowly but steadily. In addition, there are many of our class attendants who tell us they first heard of Utility Hall over the radio. It has been deemed efficient to a degree that warrants two broadcasts a week which is now our program.

The issuing of circulars is an activity of Utility Hall which is pursued to a very substantial extent. Booklets are prepared and sent out telling of the courses offered and the instruction that can be obtained. A monthly magazine is mailed to a selected list of patrons. Utility Hall also has its own cook books containing the carefully chosen recipes that are broadcast over the radio. Where patrons have failed to grasp the details in the broadcast, they are able to procure the cook books. A similar service is rendered to persons desiring a particular recipe, and upon request such recipe is mailed.

A Valuable Adjunct

Our home inspection work at present appears to be at least one of the most valuable forms of contact with the consumer. This work brings the inspector right into the customer's home where she can get a first hand understanding of the problems that that home presents. This work is now done primarily on ranges, both gas and electric. Much instruction is needed before the majority of women can make the most effective use of their stoves. Many women do not realize that a certain kind of flame gives the best heat; they do not know how to clean or adjust the burners. Our inspectors endeavor to show the housewife how to use and care for her stove and also to make her understand this care and use. All ranges sold by the company are inspected soon after installation and their care and use carefully explained. If the range does not prove satisfactory and a complaint comes in, it is thoroughly tested, often by actual baking or cooking, and the necessary adjustments are made. Much tact is frequently necessary on the part of the inspector; and if she handles an angry customer diplomatically, she can clear up any misunderstanding and make a friend of the customer for the home service department and the company it represents. Complaints come in on ranges that are on the company's gas line; and, although these ranges may not have been sold by the company, an inspector services them. Of

the three thousand ranges inspected last year, about one-tenth were complaints. The inspectors are invariably cordially welcomed, and establish friendly relations before they leave. The women who do this work are extremely tactful and have a great deal of poise, they understand ranges thoroughly and have a working knowledge of gas and appliances, and they can cook enough to turn out a perfect product for the doubting housewife who finds that her cakes will not brown, or that her pies get soggy in the new oven. This work has proved so valuable that plans are now being made to extend it in the near future.

The Crux of the Matter

Because there is no way of putting down in figures the returns from the home service department which can be compared with the expense of its operations, it is not possible to place it on a credit and debit basis. It is not difficult, however, to understand that it has accomplished something. Whether it sells many appliances or none, whether it effects greater consumption of gas or shows people how to cook with less gas, whether or not it extends the field of gas in the home is beside the question. As long as the director of Utility Hall is making friends with the visitors to the department, as long as various social organizations about the city in increasing numbers ask for her assistance as long as home inspectors are such congenial visitors that pleased housewives invite them to lunch after they have spent the morning adjusting the range, as long as people call upon Utility Hall for suggestions as to their bridge luncheons, the preparation and serving of a church supper, methods and menus in the preparation of meals, and ask for advice on a multitude of subjects, there is reason to believe that the home service department is performing a mission. When its model home creates such inquiries as "Where can I get a table like that?" "How can I have a home planned like this one?" "Where can I get those fixtures?" "How much did those bed room lights cost?" it is attracting public attention. When practical advice is asked as a daily occurrence in such queries as this, "How many cans of fruit salad will serve two hundred people?" "How can I cook such a dinner economically?" "What can you suggest for a bridge tea?" we may assume that the public is looking to the home service department for help.

And that is its purpose. Taken by and large, there is every reason to believe that the work of the home service department is rendering a service to which the sale of the company's product may seem to be merely incidental. While efficiency demands that every corporate activity contribute to the enhancement of corporate earnings, with public confidence established to such an extent that the public is coming to rely on the home service department for advice, assistance and instruction in conducting the affairs of the home, it cannot be doubted that ultimately the value of the home service department activities must be reflected in the corporate earnings. Anything that will tend to create an increase in company income and at the same time inspire public confidence is a consummation greatly to be desired.

A Valuable Hint

"The easiest sort of a home to sell is one that has some sort of a smart, up-to-date quirk in it—something different and more modern."

Something new in the way of ranges

Ask any builder or developer about his experiences in selling homes and he'll tell you about the same thing.

And in this fact there is a splendid opportunity for the gas appliance merchandiser to secure more business by cooperating with architects, builders and prospective home owners in getting something more interesting and up-to-date into their homes.

For instance, consider the kitchen of the new home. Naturally the gas appliance merchandiser wants to sell a gas range to the home owner. But unless it has some real talking point—some method of getting more interest and attention from the home owner, it may be difficult to put the sale across. But with some suggestion for a modern quirk in the home, the owner will feel more friendly toward the merchant and more like buying from him.

Right now an interesting quirk consists in putting the range in a niche in the kitchen, as shown in the accompanying photograph, rather than having it right on the floor of the kitchen. And many sales are being made by some enterprising gas appliance merchandisers by the simple process of suggesting this innovation to owners and by thus impressing the owners with the idea that the merchant is right up to the minute and that, for this reason, the goods he offers for sale must be something extra special.

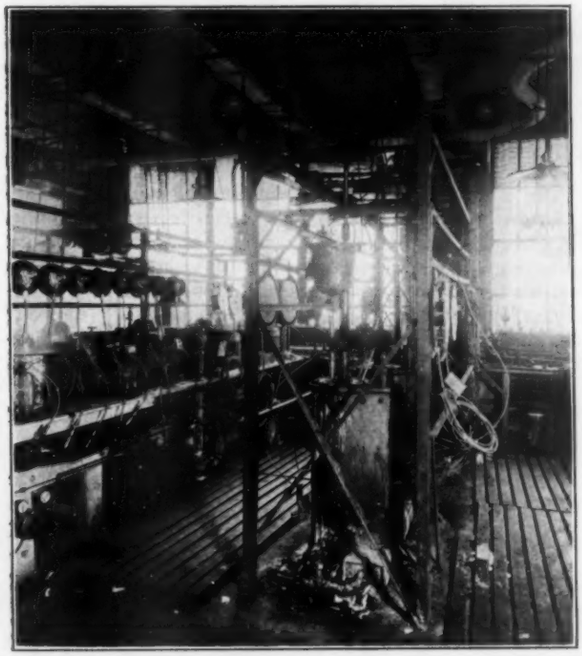
Try this plan of increasing sales and see if it doesn't help you, too.

Talk this matter over with some of your local architects who are interested in the value of gas for the home and they will quickly get the idea.

Miscellaneous Industrial Gas Applications

Making and Testing Thermometers and Gas Refrigerator Heat Controls

THE thermometer plays a very important role in industrial operations. The reliance that is placed upon it makes it essential that it should be accurate. Hence, every thermometer before it leaves the plant wherein it is made must be tested. Gas is used largely for testing thermometers in the plant of C. J. Tagliabue Manufacturing Co., Brooklyn, N. Y.



Testing Thermometers by Gas

The various thermometers, recording and indicating, undergoing testing are shown in Figure 1. Gas is used to attain the desired temperatures for the reason that it is very easily regulated and a great variety of temperatures can be obtained with its aid. Gas is unquestionably a superior fuel for this purpose, and although its consumption is not high and the application not of paramount importance to the industrial gas engineer seeking industrial load for his company, nevertheless, there are very few operations in which accuracy of control and flexibility of the gaseous fuel are so much in demand as in this particular instance.

Another very interesting operation carried out in the Tagliabue plant is the manufacture of the heat controls for the Electrolux Gas Refrigerator. The purpose of these devices is to control the operation of the gas-fired refrigerator so that it operates most efficiently and economically. The heat control is therefore, a very important part of the refrigerator, and hence it must be tested after it is made. Figure 2 shows the testing of these heat controls. Gas is naturally used for this purpose, as seen by the number of gas flames under the control of these devices in the foreground of the picture.

Refrigerator Heat Controls Undergoing Test

It is an interesting commentary on the usefulness of gas that it should be used not only in the production of cold but in the fabrication and testing of the most essential part of the refrigerator.

Glass Mirror Manufacture

GAS is an important aid in the manufacture of high grade glass mirrors, being used both directly and indirectly in the various operations. One of the essential conditions in the manufacture of this article is the availability of a steady supply of distilled water which is used in chemically cleaning the surface of the glass before the silvering solution

Coating Shellac on Silvered Mirror Backs

is applied. The gas-steam boiler is ideal equipment for obtaining a steady supply of distilled water.

The automatic operation of this apparatus through the use of a thermostat is an important feature in the attainment of a steady supply of distilled water. Another important advantage of gas is that the distilled water apparatus can be located close to the point where the actual operation of silvering is carried out.

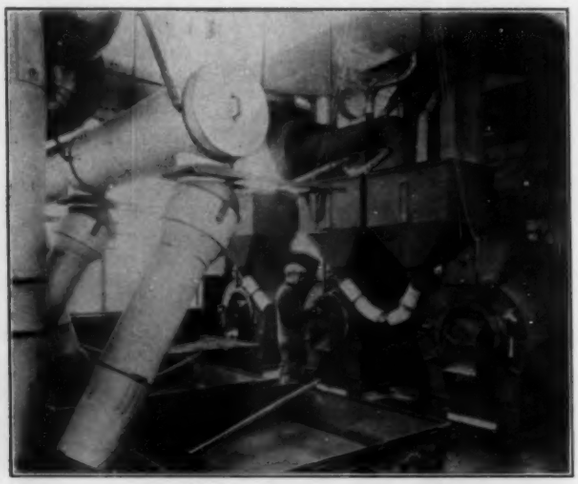
The direct use of gas in the process of making mirrors is in heating the silvering table which must be kept at a temperature of 90 to 100 degrees F. The uniformity of this temperature not only throughout the duration of the process but also all over the table is essential.

Roasting Coffee

BEFORE gas was used for the purpose, coffee was roasted in drums heated by coke or coal. Great difficulties were encountered in this process and it was only the most experienced operator that could turn out a properly and uniformly roasted coffee. For this man had to know how to build the coal or coke fire, to keep them properly trimmed and to control them besides how to adjust his roasting process to the peculiar properties of the coffee that was being treated. For not all coffees can be roasted at the same temperature.

When gas entered this field the operator was enabled to pay more attention to the quality of coffee under treatment and less to the maintenance of the temperature within the roaster. Moreover, even though gas is more expensive, being a quality fuel, the total cost of the operation was found to be less, due to the avoidance of burnt coffee and the reduction in the labor cost of tending the roasters.

The ease with which the gas flow can be controlled and the proper temperature thermostatically maintained within the roasters enable the operator to give more attention to the quality of the coffee that he is producing. The automatic feature of the operation is so well-developed that the operator can start the apparatus and proceed to another without any necessity of paying any more attention to the first roaster.



Large Capacity Gas Fired Coffee Roasters

The dirt, dust, ashes and general uncleanliness which surrounded the coffee roasting process when coal or coke was used as a fuel are entirely absent when gas is employed. There was always danger that the coffee would be spoiled by coming into contact with this dirt in the old roasting process, and furthermore, there was the additional danger that the fumes and smoke developed when solid fuels were used would spoil the product, giving it a bad odor. These conditions are non-existent when gas is employed. Other advantages of gas in this operation are that it does not occupy valuable space as does the coal or coke pile. Further, the production of the apparatus is much greater per unit of time.

All these advantages more than compensate the higher per unit cost of the gaseous fuel. Nevertheless, careful experiments have shown that the average consumption of gaseous fuel of the ordinary B.T.U. value for roasting one pound of green coffee was 0.0626 cubic foot. The gas roasting process has really been primarily responsible for the fine aroma and high quality of the coffee of today.

Fuel Economy With Six Varieties of Solid Fuel

The Engineering Experiment Station of the University of Illinois, Urbana, Ill. has recently issued Bulletin 189, which contains a great amount of interesting data and conclusions on various tests of warm-air furnaces and heating systems in a research residence. Incidentally, a copy of this bulletin may be obtained without charge by addressing the Engineering Experiment Station.

Below is given a brief tabulation abstracted from the bulletin which shows the relative economy of six solid fuels tested in the research residence:

Fuel	Heat Value B T U per Lb.	Cost Per Ton, Dollars	Relative Cost of Heating Dollars
Anthracite	12,618	16.50	160
By-product coke	13,100	13.50	127
High ash, Ill. Bituminous	11,178	6.50	100
Pocahontas	14,836	9.25	82
Low ash, Ill. Bituminous	11,881	7.75	101
E. Kentucky Bituminous	13,698	8.50	96

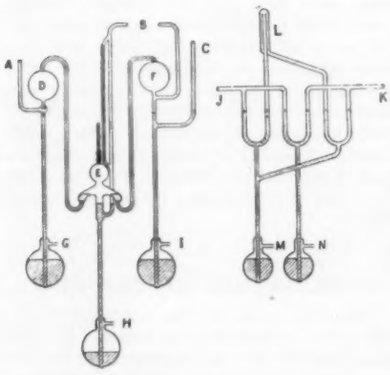
Foreman Aid in Reducing Accidents

Eight ways in which the foreman can help to eliminate accidents in his department, was recently discussed by F. A. Lauerman, safety engineer of the Interstate Iron & Steel Co., Chicago. These are: 1. Start the new man right. 2. Maintain safety discipline. 3. See that tools and machines are kept in proper repair and adjustment. 4. Know the dangerous places and practices in your department. 5. Investigate all accidents and recommend methods of prevention. 6. Put safety on the same business basis as production. 7. Good departmental housekeeping. 8. Proper care of all slight injuries.

TECHNICAL AND GENERAL MISCELLANY

APPARATUS FOR MICRO GAS ANALYSIS

This apparatus, was designed to operate on samples whose volumes would be a third of a cubic centimeter or less at one atmosphere, and to determine carbon dioxide, carbon monoxide, hydrogen and nitrogen. The pressure in the absorption tubes is usually less than two millimeters. The carbon dioxide is absorbed in soda lime; the carbon monoxide and hydrogen are oxidized by copper oxide at 250 degrees C and the water absorbed in phosphorus pentoxide; the carbon monoxide, now dioxide, is absorbed in soda lime, leaving the nitrogen.



The tube A is connected to the apparatus containing at low pressure the gas to be analyzed. A mercury diffusion pump is connected to C. The absorption train is inserted at B, one element of which is shown at the side. Suction is applied to H, I, M, N, etc., withdrawing the mercury from all the cut-offs, and the pipet and absorption train are evacuated to 10-4 mm. through the tube C. The suction is then released and by applying compressed air at G the Toepler pump D drives a sample of the gas into the pipet E. The sample is compressed into the capillary by applying pressure at H, and its pressure-volume product measured. Suction is next applied at H, allowing the gas to flow up the comparison tube and through the absorption train to the pump F. The pump is operated by applying pressure at I and the gas circulated by pumping back into E. The contraction and expansion of volume resulting helps to clear the dead space in E. The suction at H is then released and the gas pumped back into the pipet and measured. The absorption tubes are each located as at L and connected in series by the tubes J and K, etc. To pass the gas through a tube, suction is applied at M, withdrawing the mercury below the two cut-offs. To by-pass the gas around a tube suction is applied at N, releasing the suction at M. To clear the apparatus all the cut-offs are lowered as before and the gas escapes through C.—*C. H. Prescott Jr., Journal of the American Chemical Society, December 1928, pages 3237-40.*

THE PRODUCER GAS PROCESS

Haslam has investigated the processes in the producer by analytically examining the gases that are obtained at different depths in the fuel bed. Gas was taken from four points, namely, the ash zone (preliminary heating of the moist air), the oxidizing zone (reaction of carbon and oxygen to give carbon dioxide), the primary reduction zone ($CO_2 + C = 2CO$; $H_2O + C = H_2 + CO$; $2H_2O + C = 2H_2 + CO_2$), and secondary reduction zone ($H_2O + CO = H_2 + CO_2$, exchange of heat between the gas and coke).

An attempt is generally made to secure a gas with as high as possible heating value. The product of the heating value of the gas by the quantity of gas is a determinative factor in comparison with the quantity of coke consumed, which is an expression of the efficiency of gasification. The efficiency of gasification is calculated to be

$$\frac{70.5 \times (\%CO) + (\%H_2)}{(\%CO) + (\%CO_2)},$$

on the assumption that the carbon which is brought into the the producer is completely gasified. This calculation is based on the gross heating value of the gas, while the equation is as follows when based on the net heating value of the gas:

$$\frac{70.5\ (\%CO) + 60\ (\%H_2)}{(\%CO) + (\%CO_2)}.$$

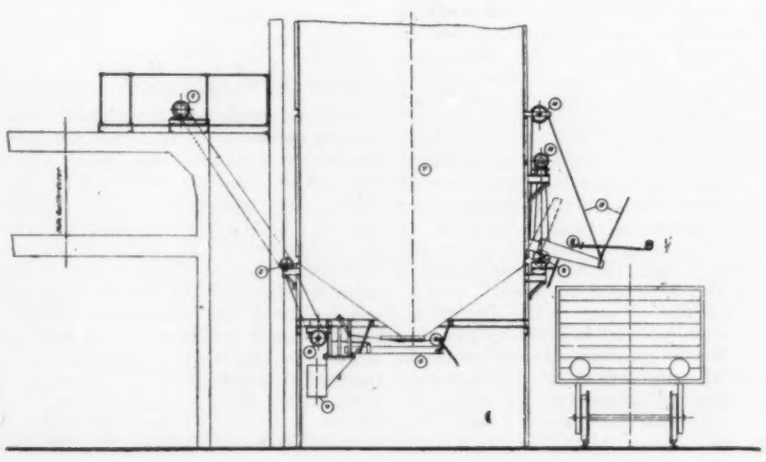
It is indicated that high heating value of the gas and high efficiency of gasification do not necessarily go hand in hand. These deductions which apply to the operation of central producers are different for the case of the single producer, where the effort is made to obtain a gas with the maximum heating value. Nevertheless, the quantity of gas and the composition of the product during the operation vary but little in both cases.

The depth of the fuel bed, the quantity of steam blown through it and the properties of the coke, that is, size of pieces and reactivity, when this fuel is used, determine the operation of the producer. According to Haslam the depth of the fuel bed and the rate of throughput do not affect the depth of the oxidizing and primary reduction zones. On the other hand, these factors increase the temperature of the primary reduction zone, the decomposition of steam, the combustible ingredients of the gas produced and hence the heating value of the latter, as well as the general efficiency of the gas making process. It has been found that the most favorable quantity of steam to use is 0.7 to 0.8 pound per pound of coke.

Experiments have also shown that the heating value and the efficiency of the gas-making process increase with the quantity of carbon dioxide. This depends on the amount of steam which should be used in the aforementioned proportions.—*J. G. Voogd, Het Gas, volume 48 pages 214ff.*

IMPROVING THE QUALITY OF COKE BY SCREENING

The installation which is used for storing the coke and filling it into sacks for domestic sale is shown in the accompanying illustration. The motor drive is indicated at 1, the power being transmitted by belt to the pulley 2, and then to the crank drive 3. The sack filler is shown at 4 and the sack shaker at 5. The slide valve closing the silo or storage bin is located at 6. The coke bin itself is shown at 7 while the loading shaking device is located at 8. The crank drive is at 9 while the pulley at 10 serves to carry the cable which holds the loading device 11.



The motor operating this device is shown at 12.

This installation fills carts on one side and sacks on the other. The loading device 8 is provided with a perforated plate which acts as a screen. The fine particles which may have been formed during the filling of the coke into the bin or in other ways are thus removed and do not reach the cart. This device is however useful only when the proportion of fines is small, for when a large amount of fines is present in the coke, this device has not the capacity to remove them.

An interesting part of this installation is the shaking device which is lowered into the cart by means of the cables. This device rotates at 300 RPM and is operated by a motor of half horsepower. The screen device will remove the fines perfectly when they are not present in too large an amount and clean coke is filled into the cart. The capacity of the apparatus is about ten tons.—*Montas Bulletin, 1929, pages 73-4.*

NEW TYPE OF GAS GENERATOR

This new type of gas generator which uses coal or pulverized lignite as fuel allows the production of a water gas and also hydrogen which can be used in the production of synthetic ammonia. The apparatus is shown in the accompanying

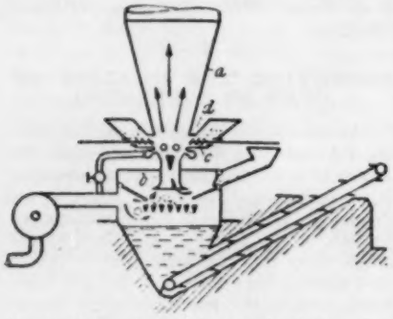
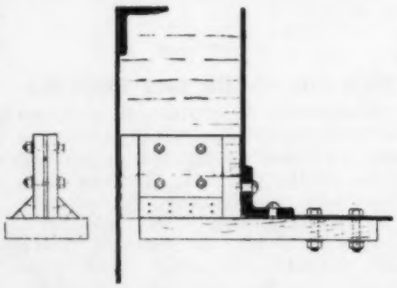


illustration. It consists essentially of a part which increases in diameter from the bottom upwards and which is provided with a cylindrical portion *b*. A belt conveyor *c* leads the fine particles of coal to the openings *d*, whence a current of air removes them and conducts them into the combustion zone. Due to the conical shape of the combustion chamber, an equilibrium is produced between the pressure of water and of air and the weight of the particles of coal. Due to the fact that the mixture of these substances is very thorough at all times, the temperature rises in a very regular manner and the apparatus operates likewise with regular results. Steam is introduced at a temperature of 100 to 120 degrees C and the clinker is removed from the apparatus by special devices. This can also be seen in the illustration. The water gas that is made by this machine has an average composition of 43 per cent carbon monoxide, 45 per cent hydrogen and 2.5 per cent of carbon dioxide.—*Journal des Usines à Gaz, 1929, page 127.*

CORROSION OF THE GAS HOLDER

Corrosion is shown to be a complex reaction. The corrosion in sheets of different thickness is studied. It is shown that the corrosion affects the surface of a thin sheet to the same depth as the surface of a thick sheet. The effect of temperature is also indicated. The question as to the best material for floating holders is also discussed. This involves a description of the properties of wrought iron, steel, copper steel, and the like. Protective means are also given attention.



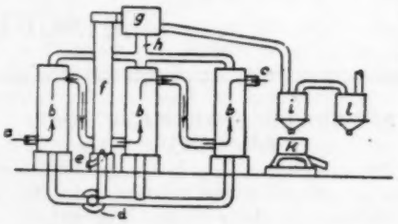
A film of oil on the surface of the water in the gas holder tank automatically coats the sides of the holder as they rise and fall. Special oils are employed for this purpose. Cross-battens are used to prevent the drifting of the oil from one side of the tank to the other under the action of the wind. These are shown in the accompanying illustration.

In cases where the cups of the upper lifts do not automatically pick up oil on rising, they must be separately oiled, and provision must be made by siphons or similar apparatus for discharging the rain water, which would otherwise tend to displace the oil.

It has been found that a film of oil on the water inside gas holders not only preserves the interior in a way which cannot be equalled by any other method, but prevents the gas absorbing moisture from the water in the tank, though not from depositing it. Hence the average amount of water passing into the distribution system is lessened. An oil film is, moreover, a good insulator and will prevent or at least delay the freezing of water in the tank.

WET PURIFICATION OF GAS

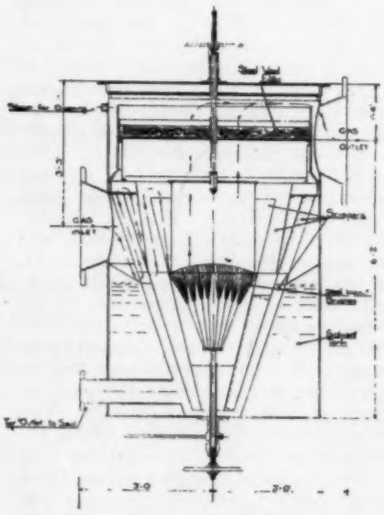
The accompanying illustration shows the arrangement of apparatus used for the wet purification of coal gas by a process which has been developed in Germany. According to this process the raw gas is treated with an alkaline liquor which contains one to two grams of iron hydroxide per liter. Iron sulphide is obtained and converted by oxidation in air to iron hydroxide and free sulphur. The sulphur, obtained in this process in a highly dispersed form, forms a foam due to the mechanical action of air and floats as a scum on the surface of the liquor. The sulphur is removed from the liquor in a sulphur separator and is dried by centrifuging. The sulphur-freed liquor is then returned to the process and used over again for purification of the gas.



This wet process is used in conjunction with a dry process and the wet installation is placed in the system before the dry purifiers. The result is that 99.8 per cent of the original sulphur content of the gas is removed. The amount of air required for the regeneration of the purifier mass amounts to between four and four and one half per cent of the total quantity of gas treated. The consumption of soda varies between 250 to 275 kilograms per day, with the gas throughout varying from 67975 to 88585 cubic meters per day. The amount of iron hydroxide used is approximately eighty kilograms per day, calculated as Fe_2O_3. The sulphur obtained contains approximately 55 to 60 per cent pure sulphur on the dry basis. The average moisture content of the sulphur is 37.5 per cent.—*Director Ferbers, Das Gas und Wasserfach, volume 71, pages 1133-6.*

ELIMINATION OF TAR FOG

This new type of tar extractor is a cast iron cylindrical apparatus 7.5 feet high and 6.0 feet in diameter. It is divided into two distinct compartments, the solvent tank and the brush and steel wool chambers. The first compartment acts as



a storage well for the oil which is circulated through the apparatus when necessary and the second is the part in which the gas passes.

The gas enters at the side and immedi-

ately makes its way in an upward and downward motion through the baffle plate and into the brush chamber. The brushes are made of steel wire and are connected to a center spindle, which may be moved by a hand wheel in either direction. These brushes offer a ready surface for the removal of the tar fog, and they also regulate the speed of the gas through the separator. This is accomplished by manipulation of the hand wheel, increasing or decreasing the gas way by the position of the brushes. The gas, on leaving the brush chamber passes up through a layer of steel wool, six inches in height and supported by a tray which removes a large proportion of the oily matter and tar.—*T. H. Madden, Gas Journal, March 13, 1929, pages 748-9.*

WATERLESS GAS HOLDER

The sides of the holder are flexible, but the gas containing part maintains its normal shape at all heights. A shallow seal is therefore sufficient. The sides are not in frictional contact with the shell but guiding means such as rollers supported by the shell are used for supporting the flexible sides. The sealing means may be such that the liquid therein tends to maintain the flexible material gas tight during rising and falling of the lift concerned. The flexible sides are in sleeve form all around the holder area and pass about a series of rollers.

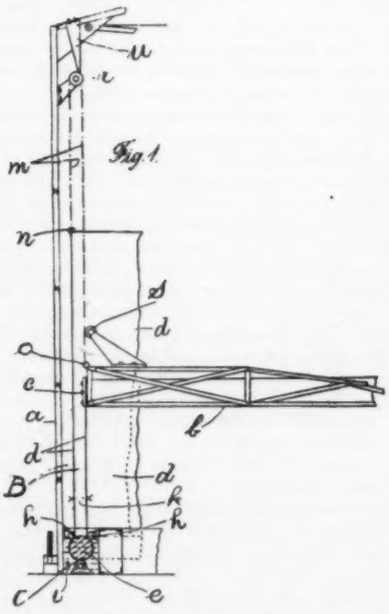


Fig. 1

The piston is shown at *c* and is firmly attached in gas tight manner to a flexible sleeve of material at *d*. This sleeve passes around a series of rollers, the clearance between rollers being sufficient to allow a slight change of angulation of the rollers as they extend all around the loop of the material *d*. It will be seen that the rollers *e* cannot be externally supported like ordinary pulleys or wheels. It is assumed that they are of considerable weight for preventing the loop of the material *d* rising as the holder is inflated with gas, or the piston *b* rises. Check rollers are shown at *h*, the diameter of the rollers *e* being slightly greater than the distance marked *k* between the sheeting or material. A roller arrangement at *i* also helps to support the rollers. Chains or flexible steel ropes or the like are indicated at *m*, connected at one end in each case to the holder sleeve at points such as *n*, at the edge parts of the sleeve *d* and at the other end to points *o* at some convenient part of the piston *b* or the material forming *d*.—*Waterless Gasholder Co. Ltd., British Patent No. 306,716.*

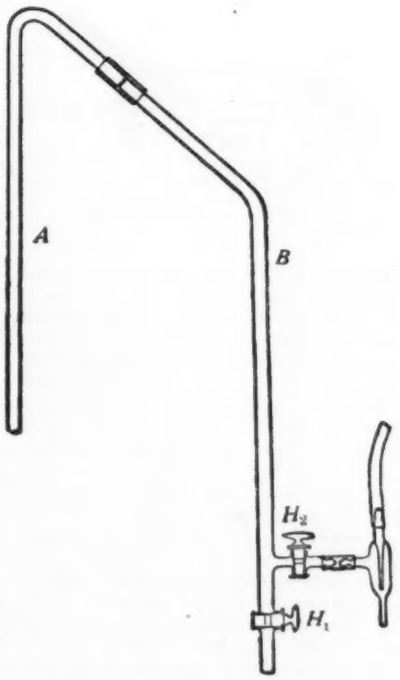
METHOD FOR DETERMINING CARBON MONOXIDE

The iodine pentoxide method is considered as suitable for the determination of carbon monoxide only in those cases where large proportions of this gas are present. The only method where gas can be correctly used for the determination of small amounts is the spectroscopic testing of absorption in blood. This method will allow the detection of one part of carbon monoxide in 300,000 parts of air.—*D. Stavorinus, Het Gas, volume 48, page 15.*

AN INTERESTING UNIVERSAL SIPHON

The advantages of this siphon, are claimed to be as follows:- first, perfect cleanliness of the decanting operation; second, ever-readiness of the apparatus for use; third, independence of pressure or suction and water seal; fourth, absolute lack of danger in use as far as the operator, materials, etc. are concerned; fifth, one pump for any number of siphons; sixth, easy replaceability of parts; seventh, low price.

The entire apparatus may be made of glass or any other suitable material. It consists of the inlet leg A and of the outlet leg B. Both are joined together with a piece of rubber tubing so that glass meets glass within the latter. The rubber joint, accordingly, does not come into contact with the liquid. A short connection with the cock H_2 is provided in the leg B. A small pump is connected with this connection. The siphon is filled by merely blowing air into it by means of the mouth. As soon as the level of the liquid reaches above the cock H_2 this is closed and the cock H_1 is opened to the flow. After the cock H_2 has been closed, the pump may be removed and used for other siphons. Inasmuch as the outlet leg B is filled with liquid to the cock H_1, additional pumping is not required, even when the siphoning action is interrupted by closing the cock H_1. The siphon may be used by simply opening and closing the cock for complete removal of liquid from large containers with various short



interruptions during the process. — *G. Beetz, Chemiker Zeitung, 1928, page 868.*

M. I. T. Industrial Gas Course

The annual industrial gas course offered by the Massachusetts Institute of Technology will be given at the Institute, Cambridge, Mass., June 17 to 22. This is the eighth consecutive year that M.I.T. has conducted a specially prepared course for industrial gas men. The course is sponsored by the New England Gas Association with the cooperation of the American Gas Association.

The course is being conducted under the able direction of Prof. Wilkes, with the assistance of other M.I.T. professors.

The cost of the course is $50, exclusive of living expenses. Special arrangements have been made for the use of dormitories by students taking the course, at a cost of one dollar a day.

The following subjects are among those which will be taken up in lectures at the M.I.T. Course:—Furnace Design and Construction, Combustion, Insulation and Refractories, Burner Application, and Report Writing. With the exception of the lectures on burner application, which are to be delivered by W. H. Hepburn, of the Surface Combustion Company, all other subjects will be covered by regular M.I.T. instructors.

The continuance of the course depends upon this year's attendance. If the course is not well attended this year, no further effort will be made to maintain an industrial course at Massachusetts Institute of Technology.

The Chain Store Will Get You If You Don't Watch Out

By William H. Matlack

RETAILERS generally, are perturbed, disturbed and very much interested, to say the least, in the ultimate effect of the general spread of chain stores and their active entry into all lines of retailing. While the utility merchandisers, selling what we term the "major appliances", have not evidenced very much concern over this movement as a whole, yet here and there we find men who are casting about for ways and means to forestall what they feel is a combative move on the part of some of these chain organizations to "horn-in" on their business. These men do not seem to view the matter of an increase of outlets for the "major appliances" through the same "specks" as those forward looking men of the industry who advocate a plan to enlist the co-operation of the plumber, the hardware man and the furniture dealer in the sale of these appliances and to do such advertising as will cause the home maker and the home manager to again become "gas-minded".

An editorial in the March issue of AMERICAN GAS JOURNAL hit this matter of chain stores, and what the Gas Industry's interest in them should be, squarely between the eyes when it said: "Chain stores have come to stay as a part of the merchandising system of the country. Hence, it behooves every industry to study carefully the part which the chain store has, or should have, in selling its wares." (We add that this applies particularly to the gas and electric industries.) After citing certain infringements on good merchandising practices, the editorial went on to say: "There is still an important place for the chain hardware store, the chain drug store and the chain department store in our scheme of appliance selling."

An Apt Thought

This is a thought well taken, in that it has been the industry's leaders' desire to induce certain other retailers to become outlets for the sale of gas consuming appliances for the home and these selling agencies are already selling approved appliances. None who have observed or studied chain store merchandising methods can doubt that they possess the vital essentials so entirely necessary to that scheme which moves merchandise from the producers' factories to the homes of the ultimate users. They have ample finances, efficient organization, store locations, as well as a thorough knowledge of advertising and display and a definite formula for what constitutes real service to the customer.

William H. Matlack

Ample finances enables them to make quantity purchases of merchandise and quality purchases of both merchandise and brains. It enables them to employ experienced men to guide both the buying and the selling ends of the business; but, just a moment, while the chain store may have a buyer whom they pay $50,000 a year, a sales promotion man whom they pay $15,000 a year and a director of advertising who is likewise well paid, do not lose sight of the fact that the skill and the experience of this able group of specialists is available to each and every link of the chain. Such expert knowledge, experience and counsel, based on the volume of business done by the chain as a whole, and the number of individual links in the chain, bring the cost per unit down to a very nominal sum and it is chargeable to sales or to advertising expense. In fact, the cost of such services per store would be no higher, if it would be as high, (for don't forget 'they know their stuff') than the cost of such time as the average independent individual personally gives to such phases of his business. Again, there is the "syndicate discount" which we may say is an extra 10 per cent for quantity purchases. Such purchases, however efficient the chain's distribution system may be, call for redistribution, which cost may be taken at five to seven per cent, the former for re-distribution where the chain is centrally located in a metropolitan area and deliveries are made from this divisional warehouse by motor trucks, the latter where delivery is made to out-lying and more remotely located stores, which are often fifteen or twenty miles away from the divisional warehouse. This accordingly reduces the chain's spread to between three to five percent below the average independent merchant. From this we must judge that the chain has very little advantage, if any, over the independent in the matter of purchasing power. We estimate that the independant has a slightly higher mark-up than the chain, yet observation proves very conclusively that these "chain men" certainly have "it", that they are real merchandisers and that they do dispose of their wares in a manner which gives them a high rate of turn-over. That is what the retailers who are now suffering with the "heebee jeebees" should resort to.

Beneficial Effect

With regard to just what effect these chain stores may have on the merchandising department of the average gas company; it seems to be the opinion of some of the reputable manufacturers that the chain store will prove very beneficial to such dealers and it will speed up the demand for gas appliances. They believe that, by reason of their consistent efforts to reach the mass-class market, it will serve to create new customers for gas service and thereby make it profitable to extend gas lines for distribution into territory which, prior to the chain store activity, was deemed unprofitable. Several manufacturers, including the manufacturer of a storage water heater, are said to be enjoying an extremely lucrative business from the chain organization outlet at the present time while others, it is understood are bidding for the chain store business.

The chain store rarely exploits the other fellows merchandise to any extent and therefore the manufacturer supplying such outlets with his merchandise has no need to advertise his products Nationally for the simple reason that such major appliances as washing machines, ranges, waterheaters, and laundry stoves, like tires, radios and other lines of merchandise, carry the chain's own private brand name. We have, however, seen one of the chains advertise the fact that certain gas appliances sold by them had been approved by the testing laboratories of the American Gas Association and carried the star of approval.

To this writer, the chain store problem

does not seem to be a problem at all but a great opportunity for the forward looking independent to cash-in on a lot of ideas produced and tested by the best merchandising talent in the country at no cost what so ever to him, other than an occasional trip of inspection to the outstanding chain stores located in his "own back yard". He may profitably study their methods of store lay-out, display, the manner in which they trim their windows and especially the manner in which they approach their customers. If the independent will do this and adopt the worthwhile ideas he picks up and inject a good amount of his own PERSONALITY into his merchandising scheme, he may rest assured that he will have nothing to worry about so far as the chain store is concerned.

Personality Factor

We strongly recommend a generous amount of personality for there is not the semblance of a doubt that it is the very biggest asset of the independent. We might say that we can not see, at this time, how the chain store is going to inject this very essential element, PERSONALITY, into its general plan. This is a possible loophole through which the independent can come out on top. Personal contact means much in the selling of any commodity.

The logical thing to do in any situation of this kind is to get the old "bean" to working and strive to gani that confidence in ourselves which says: "By gum, I am as good a merchant as the other fellow and if he, an outsider, can do it I can do it as well and I will". Then proceed to study the methods of the recognizedly good merchandisers and apply them to your own business. You may just as well forget that bunk about "folks should have sufficient pride to support home merchants. They buy cheaper than I do and they are bigger advertisers' because "chain stores have come to stay as a part of the retail merchandising system of the country.' Realize this and use modern methods and the very next time you hear anyone say; "The chain store will get you if you don't watch out", you tell 'em to go jump in the lake.

Climb on the Band Wagon

You gas men, who have been harping about encouraging other men (who know how to merchandise) to sell approved gas appliances, should climb right on the band wagon and toot your horn for these chain stores to sell approved appliances EXCLUSIVELY; that is if you really wish to build up your domestic load and at the same time cut down the service cost. The inferior, non-approved types will saddle-up on you if you do not applaud the chain store effort to sell the major appliances. Do all you can to see that they are of the highest and best class possible and you will find it will not prove nearly so gross an undertaking to make a first-rate convert out of the chain store as it has been to even approach other men who have no conception of merchandising.

New Appliances

New appliances that help to build-up and keep the domestic load are being invented all the while. One manufacturer has recently placed a dish washer on the market that should find immediate acceptance. It is a very compact little affair that is operated by placing it over a lighted main-top burner of the gas range.

Another invention that is very practical and worth while is a Super Boiler Pan. This pan if merchandised along the lines suggested by the manufacturer is going to be a wonder worker for the gas appliance salesman as well as the woman in the home. Broiling has been talked about for many years, but due to the fact that no one seemed to be able to devise a broiler sales pan or did not try to, broiling cannot be said to be one of the chief kitchen sports. The new broiler pan to say the least, should help sell broiled foods; hence broilers.

Once broiling becomes the rule rather than the exception we will have added a little bit more to the domestic meter load and furthered better cooked fish, fowl, chops and steak. With the broiler that glides in and out like a drawer, and the new types that elevate and this new Super Broiler Pan, which is also said to be "Smokeless", it seems the Home Service Departments will now be able to sell the home manager the broiling idea.

Showmanship

"It takes showmanship to put over a big sale," said the manager of one of the most active gas companies in the south. "We demonstrated that recently, when we applied it to the sale of a certain well known make of storage water heaters. We used 'show advertising' we built our displays in the theatrical manner and we used 'loud banners' on our trucks. We piled the side walk in front of our store with crated heaters each day with a banner attached telling the public that these heaters had been sold and would be delivered to our customers just as rapidly as our facilities would permit.

That it paid we cannot doubt for we had a wonderful sale and introduced many folks to the appliance that heretofore had never dreamed that such a thing existed."

One Man's Opinion

Gas men seem to be of the opinion that lack of inducements causes the customer to be elusive. At any rate that is what a fellow would judge who reads recent appliance advertising; "Our Gift To You; a beautiful Cretonne apron, rubberized, water proof, with each water heater during our June Sale," "FREE, FREE an aluminum whole meal baking set", "This wonderful China Cooking set FREE," and so on through the list.

"It seems to me", said a southern gas man, "that the premium has been over worked in our business. Women want newness it is said and we offer nothing new when we offer a premium, so we have decided to do away with premiums entirely this year and pass on the cost of such items to our customers and salesmen. We have found that the premium costs us anywhere from $3.00 to $5.00 and we are going to split that amount between our customers and our salesmen. To the salesmen we will give a bonus equal to one half of the cost of the usual premium and to the customer we will reduce the price to the extent of one half the cost of such an item during our sales."

"The buyer is well aware of the fact that he pays for the premium and after talking the matter over with my men I have decided upon the plan just mentioned. I feel that this plan will enable us to show a greater volume on major sales than we have ever shown."

Start 'em Right

June is the month of brides; the month when a great proportion of the new homes are established in America. It is the month when the gas appliance salesman who is on his toes reaps his harvest. 1929 finds him equipped with more sales ammunition than ever before, with a higher class of merchandise, more appliances with "Newness, beauty, color and design" all of which have a great appeal in this buyers' market. The big question is, not what have you but, what are you going to do with it.

Will the gas man be content to sell these new home managers a gas range and let it do at that or will he sell them carefree gas water heaters, gas refrigerators, laundry dryers, and incinerators? Will he sell them so well that he will pave the way for the sale of house heating equipment and other appliances at an early date? Will he sell them such merchandise as will prompt them to consult him whenever they are in need of home labor saving apliance or when friend or neighbor is in need of such appliances? That is the question.

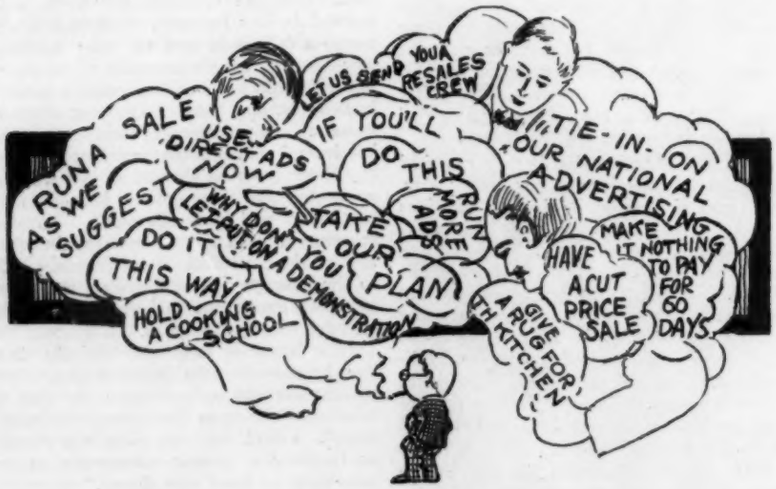
The new home manager forms a mighty big, worth while market for the appliance salesman each year;—to the tune of one million two hundred and fifty thousand, so the statisticians tel us. It is a worth while market, receptive to new appliances and new ways to conserve time. It is a market with money. What more can be asked for and it's yours if properly cul-

tivated. Let's go after it and not neglect a single item that will enable this new home-manager to make her job an efficient one.

What Are They Doing to John Dealer?

Old John Dealer is in a quandary. Everybody is telling him how to run his business. "It seems", he says, "that I am the only fellow in the world who doesn't know anything about the home appliance business. Why just last week I had to get a larger waste basket to hold my daily allotment of dealer helps, direct and newspaper advertising campaigns, window banners and truck banners for various makes of range and water heaters. Honestly, I am simply swamped with this material and then, on top of that, the manufacturers are sending swarms of representatives to take up all my waking hours telling me how to do this and how to do that. On the level, if I listened to all the plans offered me to stimulate my business, or tried out one tenth of them, I would be crazy inside of four weeks. I can't understand it all. Possibly I am getting old, judging from the number of times I have been told that this idea was passé and that line of merchandise was obsolete, or that rich red was the vogue in this and that the stylists are doing, etc., etc.

"For a time they had me worried. Then I went back in my office, closed and locked the door and looked the situation squarely in the face in order to determine just where, if anywhere, I was so much out of gear with the times. First, I took my inventory and it was in good shape and I had no old model ranges. For instance, I haven't a box range in my entire stock and I haven't had for three years. I have no cookers or any of the baby blue ones which were the pride of the stove industry a year or so ago. I have none of those dull browns. All my stock is of the newest and best designs and colors. My water heater and room heater stocks are about right for the season. I am well fixed on the newer appliances such as dryers, ironers, incinerators, and refrigerators. I have made what I positively know to be a good turnover for this business. My customers are growing in number and I am losing no old ones. Folks say my window and store displays are neat and attractive and that my sales force is cheerful and courteous My books show that, while we have no "horrible and sensational cut and slash price" sales, we are doing a nice business and doing it decently and with an increase each year at a profit. So if this is poor merchandising, then we surely are poor merchandisers. At any rate, that is our conclusion and we have accordingly ordered a sign printed to be framed and hung over our desk which reads thus: "Give us courage this day to keep our traps out of other peoples business—and to pass the courage along."


RUN A SALE AS WE SUGGEST
USE DIRECT ADS NOW
LET US SEND YOUR RESALES CREW
IF YOU'LL DO THIS
TIE-IN ON OUR NATIONAL ADVERTISING
WHY DON'T YOU LET US PUT ON A DEMONSTRATION
TAKE OUR PLAN
DO IT THIS WAY
HOLD A COOKING SCHOOL
HAVE A CUT PRICE SALE
MAKE IT NOTHING TO PAY FOR 60 DAYS
GIVE RUGS FOR THE KITCHEN

"I don't know it all. I am constantly reading books on this subject of "Business". I devote three or four hours each week to the reading of trade papers along our line. Aside from this, I attend a convention now and then. I visit with other merchants to get their points of view. I get a lot of real knowledge from certain types of manufacturers' representatives who call upon me. I am always on the alert to grasp new ideas but, hang it all, I am getting all-fired mad and tired of being told that I am incompetent of running my own business."

There seems to be much truth in what John Dealer says for in our rounds we have heard more and more of this complaint. Possibly production has so far outdistanced distribution and consumption that certain manufacturers are reverting to the tactics employed in that period of undersupply following the war and during the years of 1919 and 1920. On the other hand, however, where the manufacturer who finds himself in this over production predicament resorts to furnishing the dealer with a well thought-out plan and a man to set it up and get it going, many previous sales records have been broken. Naturally, the man who promotes the plan as well as the man who sets it in motion for the dealer, must know household appliances to such a degree that they can instill the "go-get-it" spirit into the dealer and also into his entire organization. No mere theory, combined with a bunch of pretty pictures will ever convert non-users to users in this day and age.

Good Prospects

Merchandise sales for the first quarter 1929, in the majority of instances, reflect an increase over the same period of last year and it is predicted that the second quarter will show an increase over the first quarter. Advertising expenditures in many cases have been held down during the first quarter in order to use larger space and advertise more frequently during the second quarter when temperatures are up and, for various and sundry reasons, more money is being turned loose. One man says; "While we work very hard during the first quarter we do so with the feeling that we will not cash in on our efforts until around May first. January finds folks "getting over or even" with Christmas, February finds them thinking of tax time and March and April finds them paying their taxes and getting the house cleaning under way. It is during this period that we develop prospects for the major appliances such as ranges, refrigerators, water heaters and incinerators."

Let's Be Consistent

Recently we viewed a very attractive window display advertisement. This window was piled with a well known brand of bread and display cards told the "looker" that this bread was baked in a gas oven—selling the value of gas to the bakery trade—but hold!; as we focused on the center of the display, would you believe it, there was grouped a showing of electric toasters. *Wonderful* looking bread baked in a gas oven, but, if you wish toast, use not an efficient gas toaster but an electric one.

Consistency was not a part of this display man's plan.

Cultivating Non-Users

Speaking of building up the domestic load brings up the question; What is being done to sell non users, folks who are on existing mains that do not use gas? Quoting from the Gas Service Journal we find, "Of the 27,850,000 families residing in the United States, 12,700,000 cook with manufactured and natural gas; 8,290,000 cook with coal and wood 6,000,000 with oil, and 590,000 with electricity. Data of the American Gas Association and the U. S. Census Bureau show that there are 10,830,000 homes served with manufactured gas and 3,730,000 homes served with natural gas, making a total of 14,560,000 homes. In these 14,560,000 homes connected to gas mains, there are

12,977,000 gas ranges." From these figures it seems we have something else to shoot at aside from building up the sale of gas per meter.

Why not wage war to make these inactive services active and to induce these millions who do not use a gas range to do so forthwith? It would not be our suggestion to fill up a lot of good advertising space with; "Cook with gas," but, we are of the opinion that a campaign designed to tell folks what gas the carefree fuel will do for them, in the way of making home work more efficient would be well worth while. When you stop to think of it that is the work cut out for us after all; telling folks what a wonderful thing gas is and how they may use it to make home management an easy and more efficient job.

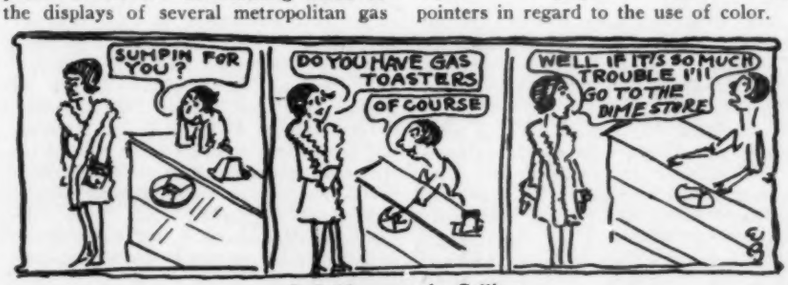
"Big League" Advertising

Keeping after the domestic load is a job that the Consolidated Gas Company of New York does in a most interesting manner; witness the three advertisements reproduced below; modern to the extent that they immediately attract attention, arouse interest and are so laid out as to be easily read, and with a copy appeal that invites farther inquiry.

That Last L-o-n-g Step Eliminated
with a Combination GAS REFRIGERATOR and RANGE
A PLEASANT INTERLUDE
Summer Water Heating by GAS
Why Take A Chance?
You can depend on Automatic Gas Refrigeration
gas ads

Histrionic Influence

Display men are appreciative of the recent theatrical innovations in the way of window display cards used by gas companies which, of course, may be directly traced to the theatre. Theatre poster artists are contributing much to the displays of several metropolitan gas companies and one display card service also secures a great deal of help from this source. If you are fortunate enough to have a good theatrical poster man in your town keep in touch with him; he will furnish you with some good ideas in regard to display and some valuable pointers in regard to the use of color.



Sad Moments in Selling

Brooklyn Union Certainly Tells 'Em

Let the Gas Furnace Heat Your Home next Winter
Retired
With this modern appliance, daily disagreeable tasks disappear into thin air and desired house temperatures are automatically maintained.
Banish the ash can, shovel and broom! Know the joys of perfect heating comfort, supplied by the gas furnace. Your inquiry will bring a prompt response.
Housheating Division
Telephone: TRiangle 7500
The Brooklyn Union Gas Company

Herewith are two ads recently used by Brooklyn Union Gas Company which are worthy of study. Consider the house heating one and note its timeliness. Its message comes to the home manager just about the time the furnace has gone out and the housewife has had her fill of dust and ashes.

It strikes us that this is a good time to prescribe for next seasons heating needs and Brooklyn Union certainly believes in keeping its lamp trimmed and burning in this regard.

Incidentally, the art work on both of these ads is clean cut and pleasing and bound to fetch a 'look' from the newspaper reader.

Smiling Through
Smokeless Fuel
The skyline grows clearer as more and more factories and shops adopt gas, the smokeless fuel, in their various heating operations.
Each year finds new uses for gas fuel in industry and it is the aim of your gas company to keep you informed of them.
For this purpose a permanent exhibit of industrial gas appliances is maintained at 180 Remsen Street. You are invited to visit it.
Industrial Division
The Brooklyn Union Gas Company

Peas Out of the Same Pod

By Ray Martin
Director of Display, Consolidated Gas Company of New York

The refrigerating unit of this combination Gas Range and Gas Refrigerator is so completely insulated that even a days baking does not effect its efficiency
HEAT ABOVE

DO you consider your windows from the same standpoint that you do the newspaper space you buy? You should, because both can do the same job, and therefore, both, generally speaking, should be handled in the same way.

For example, you will agree that in the window display advertisement illustrated above, the two lines "Heat Above" and "Cold Below," coupled as they are with a gas appliance, are interest provoking. This interest is increased by a piece of real cork insulation that, in appearance, expands as it is relieved of the weight of the gas range. The cork is used to pictorially separate the hot cooking flames above from the "cold" freezing flames below, in the same way that it does under actual conditions. Closer inspection, of course, reveals the fact that this apparent paradox is nothing other than a combination gas range and gas refrigerator.

Such advertising, regardless of whether it is a newspaper advertisement or a window display advertisement, does more than merely proclaim a truth. Rather, it translates the functions of perhaps our most interesting and modern appliance into four very understandable words.

An advertisement that tells a story at a glance is just as good in a window as in a newspaper. The truth of this statement is proven in part by the attention that large utility companies are now giving to their windows—the one medium that advertises at the point of purchase.

Recent Government Publications

Documents are available at prices indicated from Superintendent of Documents, Government Printing Office, Washington, D. C. Send cash or money order; stamps and personal checks not accepted. When no price is indicated pamphlet is free and should be ordered from bureau responsible for its issue.

Specific Heats of Gases at High Temperatures, by E. D. Eastman. Bureau of Mines Technical Paper 445. 10 cents.

Terminology in Coal Research, by Reinhardt Thiessen and Wilfred Francis. Bureau of Mines Technical Paper 446. 10 cents.

Coke-Oven Accidents in the United States During the Calendar Year 1927, by W. W. Adams. Bureau of Mines Technical Paper 443. 10 cents.

Self-Contained Mine Rescue Oxygen Breathing Apparatus, by D. J. Parker, G. S. McCaa, and E. H. Denny. Bureau of Mines Handbook for Miners. Revised in 1928. 40 cents.

Carburetion of Combustible Gas with Butane and Propane-Butane Mixtures—With Particular Reference to the Carburetion of Water Gas, by W. W. Odell. Bureau of Mines Bulletin 294. 25 cents.

Petroleum Refineries in the United States, January 1, 1929, by G. R. Hopkins, and E. W. Cochrane. Bureau of Mines Information Circular 6116. Mimeographed.

Survey of Gravities of Domestic Crudes, by G. R. Hopkins and A. B. Coons. Bureau of Mines Information Circular 6114.

Fundamental Basis for Controlling and Gauging Natural—Gas Wells, by H. R. Pierce and E. L. Rawlins. A resumé of a study by the Bureau of Mines, issued in two parts as follows: Part 1, Computing the Pressure at the Sand in a Gas Well, Serial 2929; Part 2, A Fundamental Relation for Gauging a Gas Well, Serial 2930. Mimeographed.

A Study of Gauze Heating in Miners' Flame Safety Lamps, by E. J. Gleim and others. Bureau of Mines, Serial 2913. Mimeographed.

Use of a Type N Miner's Gas Mask, by S. H. Katz and G. S. McCaa. Bureau of Mines Miners' Circular 32. 10 cents.

Advanced Mine Rescue Training Part III.—Protection Against Gases Encountered in Mines, by J. J. Forbes and G. W. Grove. Bureau of Mines Miners' Circular 35. 15 cents. Parts I and II of this group have not yet been issued.

Gas and Electric Fixtures: Lamps, Lanterns, and Reflectors. Mimeographed preliminary statistics from the 1927 Census of Manufacturers.

Discharge Coefficients of Square-Edged Orifices for Measuring the Flow of Air, by H. S. Bean and others. Bureau of Standards Research Paper No. 49, reprinted from Bureau of Standards Journal of Research for March, 1929. 20 cents.

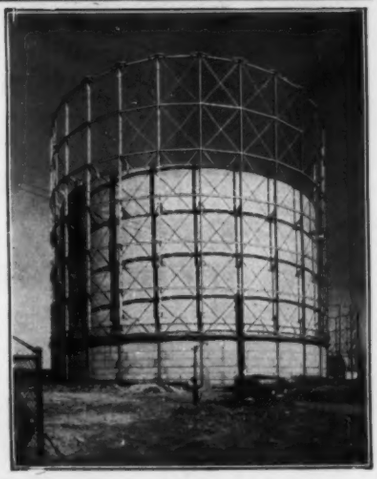
Lime for Ammonia Distillation. Bureau of Standards Circular 373. 5 cents. Recommended specifications for quicklime for use in the distillation of ammonia from ammonia liquors obtained in coke and gas manufacture.

Discharge Coefficients of Square-Edged Orifices for Measuring the Flow of Air, by H. S. Bean, E. Buckingham, and P. S. Murphy. Bureau of Standards Research Paper 49. 20 cents. An important fundamental report of value to any considering orifice-meter and similar problems.

The Classification of North American Coals, by A. C. Fieldner. Bureau of Mines Information Circular 6094. A critical discussion of the systems of classification which have been proposed or are in use.

Fuel Statistics. Several important statistical summaries have recently appeared as follows: Production of Fuel Briquets in 1928, Bureau of Mines mimeographed summary; Petroleum Refinery Statistics, 1927, by G. R. Hopkins, issued as Bureau of Mines Bulletin 297, 20 cents; Natural Gas in 1927, by G. R. Hopkins and H. Backus, separate from Bureau of Mines Mineral Resources series, 5 cents; Wood Distillation and Charcoal Manufacture, mimeographed data from the Census of Manufactures, 1927; Petroleum Refining, mimeographed data from the Census of Manufactures, 1927.

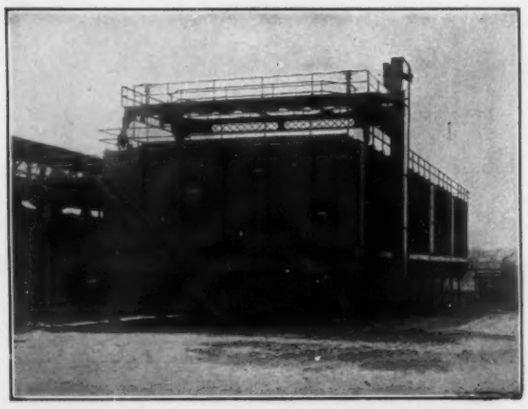
"Built to Insure Good Service"



The "Stacey Bullet", to paraphrase the slogan of the Columbus Electric and Power Co., which appears on the pair of "Stacey Bullets" shown above, is "Built to Insure Good Service" to every Gas Company and consequently "Good Gas Service" to the community.

The "Stacey Bullet" is a most practical and economical form of high pressure storage. Any number of sections can be added as required, thus making it an investment that pays generous dividends in utility, longevity and ample service as needed.

The Ten Million cubic foot holder at Buffalo, N. Y., shown here was likewise "Built to Insure Good Service." Long Beach, Calif., has also been well served by a Stacey Bros. Ten Million Holder and now the Pacific Gas & Electric Co., has ordered a Stacey Bros. Ten Million to serve San Francisco.



Stacey Brothers Purifiers are built with characteristic thoroughness, reducing to a minimum the cost of operation and maintenance.

Acquaintance with our facilities, policies and methods will prove to you our

"Ability to Serve"

STACEY BROTHERS GAS CONSTRUCTION CO.

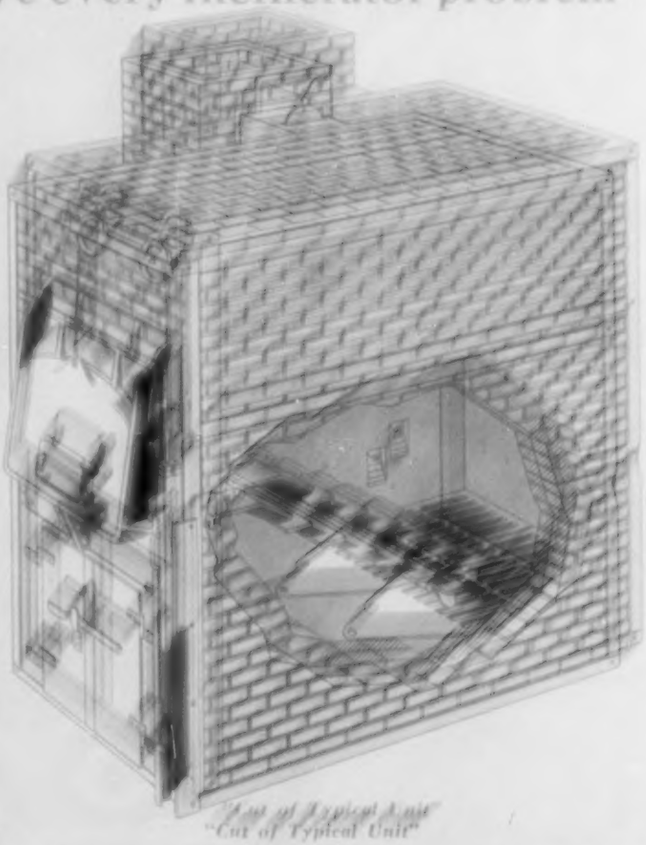
CINCINNATI, OHIO

JAMES E. STACEY, Pres. ANDREW J. STACEY, Vice-Pres. WAYNE STACEY, Gen. Sales Mgr.
ARTHUR A. POPE, Sec. and Treas. WILLIAM A. MILLER, Chief Eng. P. C. Rodgers, Asst. Sales Mgr.

NEW YORK OFFICE—75 West Street—P. F. McEnaney, Mgr. Tel. Bowling Green 8186
New England Representative—Eastern Service Co., Boston

INCINOR NOW AVAILABLE FOR EVERY GARBAGE and

We are now in a position to offer a complete service to solve every incinerator problem



"Cut of Typical Unit"

come of years of successful development and practical experience.

Goder designed step-grade incinerators are prac-

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HOME INCINERATOR

PLE IN "BRICK-SET" MODELS
WASTE DISPOSAL PROBLEM

tically universally adopted and in use for years under widely varying conditions with completesatisfaction. INCINOR "Brick Set" types are erected on the customer's premises under the supervision of INCINOR superintendence in accordance with proposal and detailed blue prints previously furnished, whenever possible in cooperation with your industrial engineering department. INCINOR "Brick Set" type opens a new and profitable field for splendid increased gas load.

SPECIFICATIONS OF TYPES 0 TO 4 INCLUSIVE
INCINOR BRICK SET MODELS

	Type 0	Type 1	Type 2	Type 3	Type 4
Dimensions					
Height	8' 6"	8' 0"	8' 0"	8' 3"	8' 3"
Width	5' 7"	8' 0"	10' 0"	14' 0"	16' 0"
Length	6' 6"	8' 0"	8' 0"	8' 0"	8' 0"
Grate Area (Square feet)	10	Single Cell 11	Single Cell 17.5	Twin Cell 22	Twin Cell 35
Capacity per hour (Pounds)					
60% garbage & 40% rubbish	175	300	450	650	1000
Combustible rubbish		400	600	800	1200
Recommended Maximum size	12x14"	18x18"	20x20"	24x24"	30x30"
B.T.U. Required per hour (Approximate)	125,000	150,000	180,000	250,000	300,000

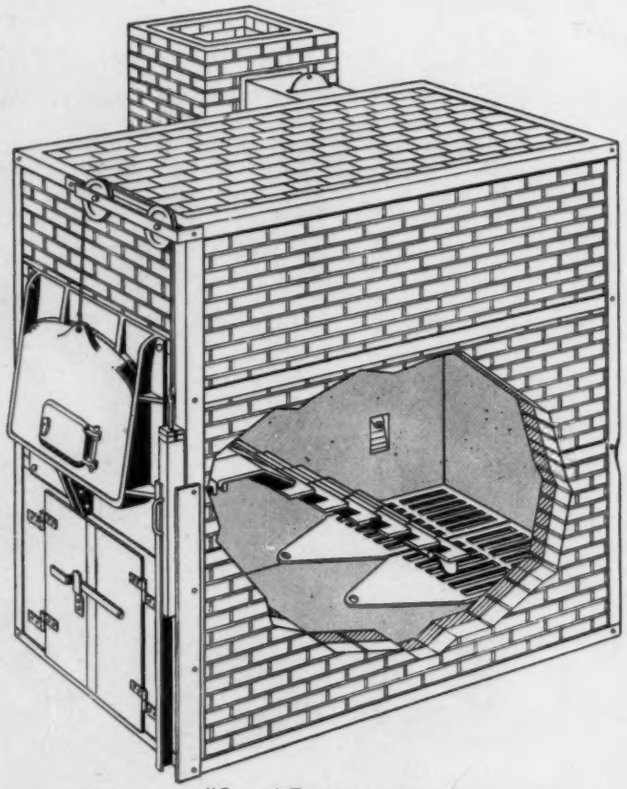
Details contained in Our New Catalog No. A202

COMPANY MILWAUKEE, WIS.

INCINOR NOW AVAILA FOR EVERY GARBAGE *and*

WE are now in a position to offer a complete service to solve every incinerator problem your customers may have through our recent acquisition of Jos. Goder & Staff, Chicago, Ill., designers of special types of incinerators for the past twenty years.

All "Brick Set" INCINORS are designed by and built under the supervision of Mr. Jos. Goder, and are the outcome of years of successful development and practical experience.



"Cut of Typical Unit"

Goder designed step-grade Incinerators are prac-

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HOME INCINERATOR C

BLE IN "BRICK-SET" MODELS WASTE DISPOSAL PROBLEM

tically universally adopted and in use for years under widely varying conditions with complete satisfaction. INCINOR "Brick Set" types are erected on the customer's premises under the supervision of INCINOR superintendence in accordance with proposal and detailed blue prints previously furnished, whenever possible in cooperation with your industrial engineering department. INCINOR "Brick Set" type opens a new and profitable field for splendid increased gas load.

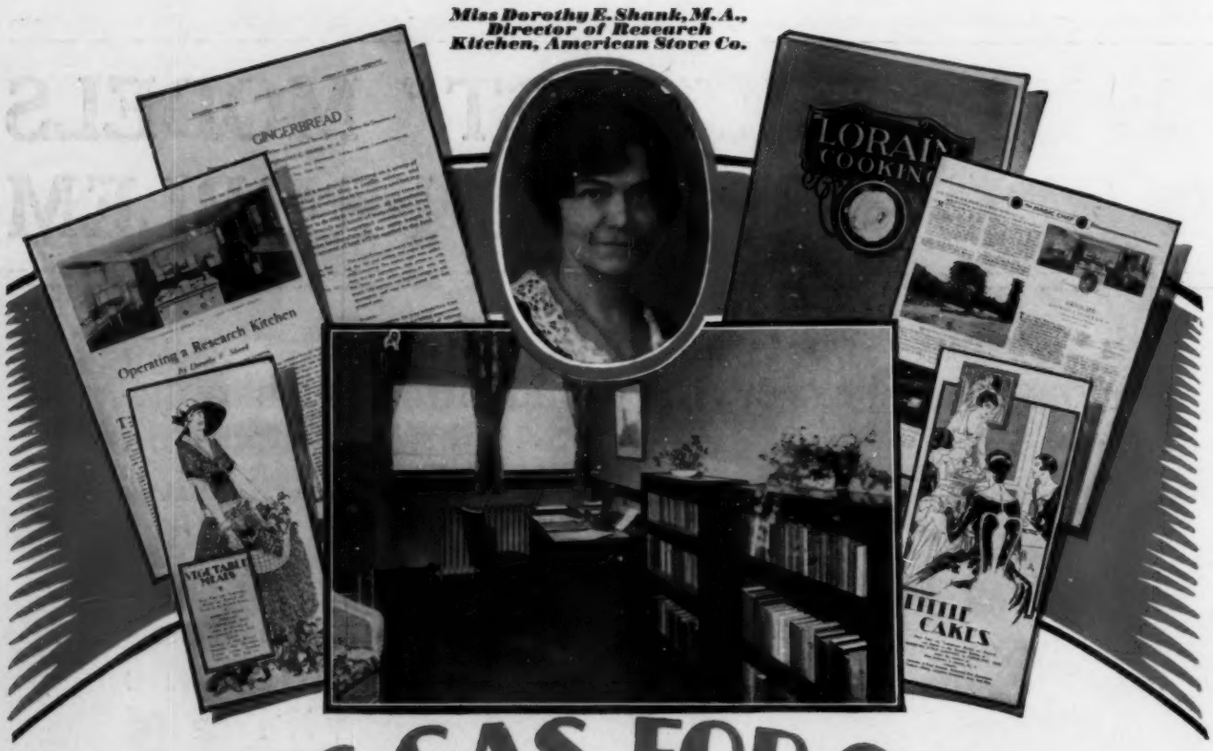
SPECIFICATIONS OF TYPES 0 TO 4 INCLUSIVE
INCINOR BRICK SET MODELS

	Type 0	Type 1	Type 2	Type 3	Type 4
Dimensions:					
Height	8' 0"	8' 0"	8' 0"	8' 3"	8' 3"
Width	3' 7"	8' 0"	10' 0"	14' 0"	16' 0"
Length	6' 6"	8' 0"	8' 0"	8' 0"	8' 0"
Grate Area:		Single Cell	Single Cell	Twin Cell	Twin Cell
(Square feet)	10	11	17.5	22	35
Capacity per hour (in pounds)					
60% garbage, & 40% rubbish	175	300	450	650	1000
Combustible rubbish		400	600	800	1200
Breeching:					
Minimum size	14x14"	18x18"	20x20"	24x24"	30x30"
B.T.U.-Requirement when auxiliary fuel is used:	120,000	150,000	180,000	250,000	300,000

Note: Proposals on above and larger applications furnished on request

Contained in Our New Catalog No. A202

COMPANY MILWAUKEE, WIS.



Miss Dorothy E. Shank, M.A., Director of Research Kitchen, American Stove Co.

SELLING GAS FOR COOKING

IN the Research Kitchen of American Stove Company are prepared the famous Lorain Time and Temperature Recipes which have been distributed by the millions to the four corners of the earth.

Here, also, is created the much-appreciated "Bulletin" issued to over 8600 schools and teachers of cookery throughout the United States.

Here, also, is edited "Lorain Cooking," a cloth-bound cook book that is given to every purchaser of a Red Wheel Gas Range.

In addition, Miss Shank is a frequent contributor of articles on Time and Temperature Cookery to the great national publications.

"Magic Chef," American Stove Company's monthly dealer magazine, carries an article by Miss Shank in each issue for the benefit of home service departments and those who sell Red Wheel Gas Ranges.

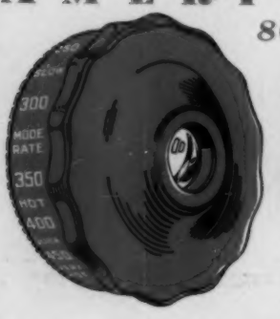
Since the establishment of the Research Kitchen it has been visited by practically every outstanding Domestic Science authority in the United States.

Truly this *is* the home of "cook with gas" propaganda—propaganda that is unselfish and helpful to all who sell or use gas and Red Wheel Gas Ranges.

AMERICAN STOVE COMPANY

801 Chouteau Avenue • • • • St. Louis, Mo.

LARGEST MAKERS OF GAS RANGES IN THE WORLD



LORAIN RED WHEEL

These are the Six Famous Brands of Red Wheel Gas Ranges:

DANGLER · CLARK JEWEL · QUICK MEAL
DIRECT ACTION · NEW PROCESS · RELIABLE

Equipment News

Improved Method of Installing CO_2 Meters

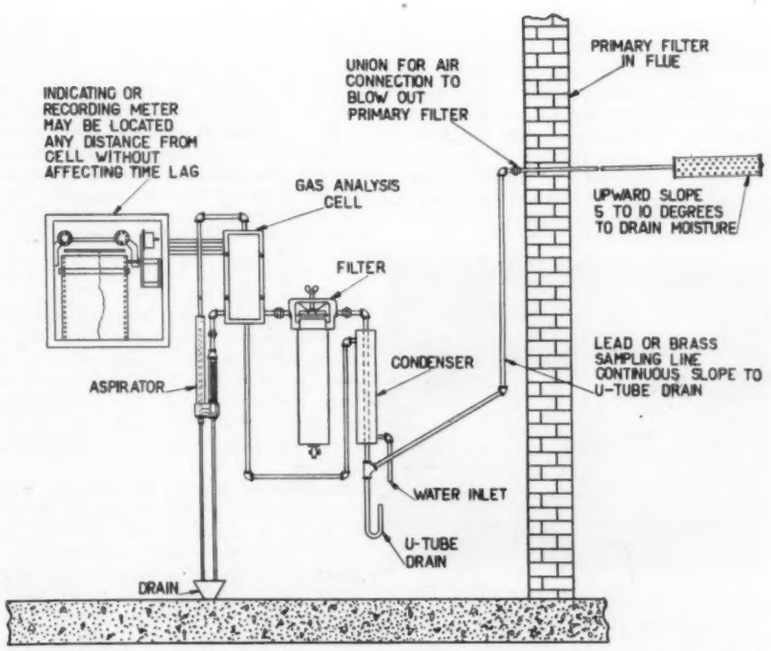
The Brown Instrument Company of Philadelphia, has worked out an ingenious method of installing their CO_2, apparatus, working on the thermal conductivity principle. In this system of analyzing gases, the relative capacity of air to conduct heat as compared with the gas to be analyzed, is used to operate electrical indicating and recording instruments calibrated directly in per cent CO_2.

Figure 1 illustrates the latest method of installing this apparatus and eliminates trouble due to clogging, and gas leaks. which were heretofore experienced.

A primary filter consisting of perforated metal supporting asbestos cloth, projects into the flue or furnace. The pipe supporting this primary filter slopes downwards from the filter so moisture is drained off.

The sampling line runs directly down to the U-tube drain which collects excess moisture and acid. The gas then passes through a condenser where it is cooled to prevent any accumulation of moisture in the analysis cell.

A union connection is made at the sampling tube so the primary filter can be blown out occasionally. In practice, this blowing out is done only at comparatively infrequent intervals.


INDICATING OR RECORDING METER MAY BE LOCATED ANY DISTANCE FROM CELL WITHOUT AFFECTING TIME LAG
UNION FOR AIR CONNECTION TO BLOW OUT PRIMARY FILTER
PRIMARY FILTER IN FLUE
GAS ANALYSIS CELL
UPWARD SLOPE 5 TO 10 DEGREES TO DRAIN MOISTURE
FILTER
CONDENSER
LEAD OR BRASS SAMPLING LINE CONTINUOUS SLOPE TO U-TUBE DRAIN
ASPIRATOR
WATER INLET
U-TUBE DRAIN
DRAIN

A secondary filter consisting of a container with steel wool, and cotton, is placed in the line in front of the cell.

The thermal conductivity cell contains four platinum filaments of comparatively heavy wire mounted in gold plated cells with gold lined passages. Two of the cells contain air. The other two contain gas to be analyzed, the thermal conductivity of which is to be compared to air.

From the cell, 5-wire cable runs to indicating or recording instruments calibrated directly in percent CO_2.

It is claimed that this new piping arrangement, improved condenser filter, and cell assembly, marks a substantial advance in the perfection of CO_2, analyzing apparatus, operating on the thermal conductivity principle.

Improved Broiler is Development of Gas Association Research

The first real improvement in heating heavy duty broilers for use in hotels, restaurants, and clubs has been developed and recently pertected through research sponsored by the American Gas Association. This is in the nature of a radiant surface heater. With this type of burner an incandescent refractory slab projects a solid sheet of radiant heat of 1300 degrees Fahrenheit down onto the food thus affording the fastest heat transfer known. This radiant heat has a penetrating quality which cooks the food 25 per cent faster than any other known method without burning and thereby preserves the vitamins and retains the juices. It also permits prompter service to patrons, effects a reduction in fuel consumption and operating costs, and puts gas in the ascendancy over charcoal and electricity in both efficiency and cost.

This broiler is the simplest one to operate now known as the entire control is centered in a single switch which can be snapped on or off at will. For this reason the service required by kitchen employees is reduced to a minimum.

This radiant surface burner was developed through a program of research covering a period of years by the American Gas Association in cooperation with the Surface Combustion Co. and the Standard Gas Equipment Corp. The principle embodied is entirely new for radiant heat is produced on the face of a porous alundum slab which sets in a shallow cast iron box. The gas is forced through this slab and lighted on the exposed face which it quickly brings up to incandescence thus producing a radiant bed of fire like that produced by charcoal. The advantage, however, lies in the fact that the heat from this burner can be projected down onto the food and can be had almost instantly and at all times by the simple snapping of a switch. It also does away with charcoal and ash handling, fire building and tending.

This radiant slab projects heat in any direction it faces, just like the sun, and has an operating temperature on the food of 1300 deg. F. The heat from the ordinary burner has a temperature of only 750 deg. F. and rises where it should project downward.

One of these new broilers has been in daily use in the laboratory for more than three years. Supplementing the laboratory tests, field tests on more than 25 of these broilers have been conducted at some of the largest hotels in the country for more than a year and under the most severe conditions. These have proved more than satisfactory and the burners show no deterioration whatever.

Proper Preheating Practice

The preheating facilities necessary in any welding shop or department depend upon the run of work handled. Cast iron welding forms perhaps a major part of the average welding shop's daily work and it pays the shop manager to give close study to preheating problems encountered in the various types of castings. Small pieces can be preheated by the oxy-acetylene blowpipe and welded without much difficulty. This method, however, is impracticable for larger pieces. A blacksmith's forge is sometimes used for certain pieces, but with this there is the possibility of overheating or burning the metal on one side, if constant care is not exercised.

The most practical and most economical method of preheating large pieces particularly where the entire casting is to be heated, is the use of the temporary firebrick furnace built of loose firebrick laid

without mortar. It is quickly constructed and can be built to any size desired. The accompanying illustration shows a large preheating furnace encasing a heavy iron casting. Asbestos paper, having holes for draught if necessary, forms the top of the furnace. The spacing of the bricks around the base of the furnace assures sufficient draught to raise the piece to the proper temperature.

In order to keep a desired temperature, the fire must be regulated occasionally while the welding progresses. This is done by opening or closing the draught holes, rearranging the asbestos paper covaring, moving hot coals from one place to another, or replenishing the fire whenever necessary. This important detail is usually performed by a helper. When the casting has reached an even, dull red heat, an opening is made in the asbestos paper cover just large enough to uncover the weld area, and welding is done through this hole.

After the weld is completed it is just as important to secure proper cooling. The entire casting or piece should be covered with fresh charcoal and brought up to an even heat. With the asbestos covering intact, the finished work should be allowed to cool and contract evenly in the dying fire. It is important that one part does not cool quicker than any other. If this happens the piece may crack due to an uneven "pull."

Preheating and annealing of cast iron is an essential part of welding technique. It is not a difficult feature for the methods of constructing the preheating furnace and governing the preheating temperature are easily understood.

C-E Water Level Indicator

A simple device which permits the placing of water level indicators at any desirable location or elevation has been recently put on the market by Combustion Engineering Corporation, New York.

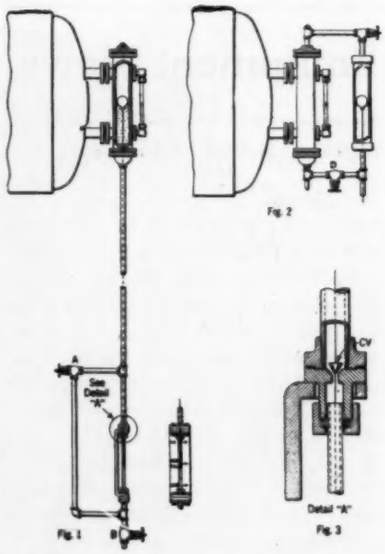
Fig. 1, shows how this water level indicator operates and why it is possible to situate it at any convenient location. The usual water column is shown connected to the boiler drum. Inside the water column is a non-corrosive float suitable for the maximum working pressure for which the boiler is designed. This float is direct-connected by means of a non-corrosive wire extending downward through a small pipe to an indicator in the water glass. The circuit around this indicator is filled with cold water which has no corrosive effect on the glass.

The indicator is so adjusted that when the float in the water column on the drum is in its normal position, the indicator within the lower glass is also in the center of the glass, its normal level condition. The indicator consequently fluctuates correspondingly with the up and down movement of the water column float at the drum.

It is possible to locate the indicator to meet any local conditions. If it is not practical to drop the indicator vertically from the water column on the drum, arrangements are easily made whereby the water column can be placed inside the drum, or, as shown in Fig. 2, horizontal extensions of any length can be made to bring the water column to any desired position.

To prevent leakage in case the water glass should be broken, an automatic shut-off valve is placed in the circuit directly above the glass. This conical valve is attached to the wire between the water column and the water level indicator in such a position, as shown in Fig. 3, that when the glass is broken, and the water released, the valve is forced into the valve seat thus closing the cold water circuit.

After a new glass has been put in place, valve "A", Fig. 1, is open, valve "B" remaining closed thus equalizing the pressure above and below the valve. The float then returns to the position of the water level and in so doing, lifts the valve "CV" which allows the water to again fill the indicator gage glass.



The device is especially desirable from a convenience standpoint and also, because it operates in a cold water circuit, it eliminates the continual replacing of glasses on ordinary water columns, which are eaten away and broken so easily by the corrosive action of the hot water. By having cold water, only, in contact with the glass, the usual round glass is suitable for exceedingly high pressures.

The C-E Water Level Indicator can be installed in conjunction with, or separate from, the regular high and low alarm signal system.

Peculiar Rate Situation

Municipality sues to compel utility to increase rates—Other important legal happenings involving gas.

By Leo T. Parker

SELDOM do we find litigations in which a municipality sues to compel a public utility to increase its rates.

However, it is interesting to observe that in Mapleton v. Iowa Public Service Co., 223 N. W. 476, this situation arose. Also, a State law was before the Court for interpretation, as follows:

"Regulation of Rates: They (cities) shall have power to.....regulate and fix the rent or rate for water, gas, heat, light, or power; to regulate and fix the rents or rates of water, gas, heat, and electric light or power; to regulate and fix the charges for water meters, gas meters, electric light or power meters, or other device or means necessary for determining the consumption of water, gas, heat, electric light or power, and these powers shall not be abridged by ordinance, resolution, or contract."

A city ordinance fixed the rate, and the public utility fixed its rate lower than the ordinance rating. The city filed suit to compel the utility company to increase its rates to those specified in the ordinance, because the city owned a competing plant and did not desire the public utility to "cut" the established rates.

The counsel for the public utility contended that the above quoted State law is invalid, but the Court held that the public utility must charge the rates specified in the ordinance, saying:

"The anomaly of the situation is that we have never hitherto had before us a municipality as a litigant contending for an uplift in rates, nor a public utility contending for the right to reduce them

.....On the face of the record, each party appears to be contending for the privilege of generosity toward the other. Apparently, also neither party has a grievance.....The reader of the foregoing will naturally query: What is the matter? Where is the storm area? Why the tempest? Here is the rub: The incorporated town of Mapleton owns and operates a municipal plant in its proprietary capacity.....Our conclusions on the whole record may be summed up briefly: A public utility, operating under a franchise, has no constitutional right of competition. Moreover, a rate war is not necessarily competition. It may be, and usually is, a mere fight, which bodes nothing to the public but disorder and disorganization. The business of a public utility, under statutory regulation, becomes, by force of the statute, a legal monopoly. The power of statutory regulation is not affected: nor is the character of the business, as a monopoly, changed by the fact that two franchises are granted and accepted by the respective companies, each of which tenders its service to the patrons. The advantage of a monopoly is its economy..... Though it be true that the town in its governmental capacity has a necessary interest in its own plant, and might therefore be deemed disposed to discriminate against the defendant, in the exercise of its governmental functions, yet it has not done so. The ordinance is applicable to both franchise holders."

New York State Law Held Confiscatory

Two unusually important points of the law were decided by a United States Court in the case of Queens Borough Gas & Electric Co. v. Prendergast, 31 F. (2d) 339.

In this case it was shown that the New York legislature enacted a law in 1923 limiting the rate chargeable by gas companies in cities having a population over 1,000,000 to $1 per 1,000 cubic feet and the quality of the gas was increased from 537 B.T.U. to 650 B.T.U.

The gas company contested the validity of the law, with respect to its applicability under the particular circumstances, on the grounds that a portion of its customers served live in New York City and the other portion are in an adjoining county. Furthermore, it was proved that the cost to produce gas is 99c per 1,000 cubic feet.

Therefore, the statute compelled the gas company to supply gas to consumers in the city of New York at $1 per 1,000 cubic feet at a loss, whereas persons living in the adjoining county under similar conditions, with only an imaginary line separating the two counties, were paying a minimum rate of $1.30 per 1,000 cubic feet.

Also, the gas company contended that the law was invalid, because in 1922, previous to the enactment of the statute in litigation, the former had entered into a contract with the Public Service Commission by the terms of which approximately the minimum consumer's rate was $1.30 per 1,000 cubic feet.

In other words, the counsel for the gas company argued that the rate so agreed upon had the force and effect of a contract binding upon the State, and that the State was estopped from regulating and reducing the rate during such period, and under which the company's rights to a continuance of such rate for the agreed period are protected by Section 10, Article 1, of the Federal Constitution.

However, it is interesting to observe that the Court held a contract of this nature made with the Public Service Commission may be changed by later statutes, saying:

"It is now settled that the prescription of the rate and standard by the Public Service Commission and the acceptance thereof by the gas company do not constitute a contract within the meaning of Section 10, Article 1, of the Constitution, *even where the period for which the rate shall continue in force has been prescribed and accepted under specific legislative authority* and the continuance of the rate for such period has been stipulated as one of the terms and conditions of the company's agreement to accept the rate at all."

Also, it is important to know that the Court held the statute invalid on the grounds that it confiscated property without just compensation. It was also held that the gas company was not required to prove the exact apportionment of operating costs within New York and the adjoining county. The Court said:

"The statute under consideration..... divides plaintiff's (gas company's) consumers into two groups, one group of which is to pay a $1 rate and the other to pay a $1.30 rate. No reason for the discrimination appears upon the face of the statute.....Of the legislative power to properly prescribe different rates for different counties there is, no doubt. Of the wisdom of prescribing two widely divergent rates for two contiguous counties, both very much alike in density of population, both very much alike in the character of service, and both served by the identical gas plant, there might be considerable debate.....When a company is authorized to charge different rates, *two different rate bases are necessarily involved.* When the rates are differentiated by nothing more substantial than an artificial county line, the diversity is difficult to justify.....The proof shows that, at the time that the statute under review took effect, its (gas company's) operating costs, exclusive of the value of its properties, amounted to approximately 99 cents per 1,000 cubic feet. The cost to produce and sell the gas applies to the consumers in both counties alike.....For these facts alone, the statute must be held confiscatory as to the plaintiff (gas company).....the master feels that he has fully discharged his duties.....by valuing plaintiff's unitary gas business as a unit, without making an allocation of values as between the two counties."

Undoubtedly, this opinion may be appealed to the highest United States Court, but it seems positive that the decision is well supported by previous higher Court cases.

Gas Company Entitled to Remove Buildings

It is interesting to know that any firm which erects frame buildings, not legal fixtures, upon leased land may rightfully remove the same at the termination of the lease contract.

This point of the law was involved in the recent case of Kay County Gas Co. v. Bryant, 276 Pac. 218. The facts of the case are that a gas company entered into a contract with a land owner, whereby the latter consented to the former erecting upon the premises certain frame buildings used to enclose machinery, a warehouse, an engine room, and three small cottages. All of the buildings were set upon concrete foundations, and the gas company paid a yearly rental for the privilege.

When the lease terminated the land owner attempted to prevent the gas company from removing the buildings. However, the Court held the gas company entitled to dismantle and remove the structure, saying:

"Generally a building erected on the land of another by his consent or license does not become part of the realty, but remains the property of the person annexing it.....Such a building does not pass to a purchaser of the land..... This rule certainly holds when there is an express reservation of a right to remove the building and generally it is considered that where the landowner consents to the placing of a building on his land by another without an express agreement as to whether it shall became a part of the realty or remain personalty, and agreement will be implied that it is to continue personal property.....Three general tests which may be applied in determining what are fixtures: (1) Annexation to the realty, either actual or constructive; (2) Adaptation or application to the use or purpose to which that part of the realty to which it is connected is appropriated; and (3) Intention to make the article a permanent accession to the freehold."

City Not Liable for Injury to Pedestrian

While it is well established that a municipality is liable in damages for injuries sustained by pedestrians who stumble over defective streets, yet it is also true that citizens who walk over streets in which gas mains are being laid do so at their own risk.

For instance, in the recent case of McCarthy v. City of Boston, 165 N. E. 123, it was disclosed that a pedestrian, while walking upon a sidewalk, partly torn up, fell sustaining severe injuries.

He sued to recover damages for the injuries, but the Court held the city not liable, stating the following important law:

"Beyond dispute the way was defective .....The city had not put up any barriers to prevent its use, nor posted any sign as a warning to travelers. The way was not closed.....The question is whether a liability exists for injury resulting from defects in the highway..... The conditions were the necessary incidents of the reconstruction and repair of the way. While that was in progress the obligation to keep the way in a condition reasonably safe and convenient for travel was suspended. *Anyone who used the way in daylight did so at his own risk.* The work going on was sufficient notice to travelers. The lack of knowledge in regard to it on the part of an uninformed traveler does not revive the liability."

Degree of Proof Required to Establish Negligence

It is important to know that a gas company is liable in damages, if the natural inferences to be deducted from the testimony are that an explosion of gas is caused by negligence of the company's employees.

In other words, the law does not require in an injury suit that the injured person positively prove negligence of the gas company or its employees.

For example, in Cracraft v. Wichita Gas Co., 275 Pac. 164, it was disclosed that an explosion occurred causing injury to a building and death of an occupant. Proof was submitted indicating but not positively proving, that the gas entered the basement through a leak in a main line. Since it was shown that the gas company had been notified of the leak, but failed to repair its pipes, the court held the gas company liable, saying:

"It is true that direct proof of negligence is not necessary. Like any other fact, negligence may be established by the proof of circumstances from which its existence may be inferred. But this inference must, after all, be a legitimate inference and not a mere speculation or conjecture. There must be a logical relation and connection between the circumstances proved and the conclusion sought to be adduced from them..... Circumstantial evidence in a civil case, in order to be sufficient to sustain a verdict, need not rise to that degree of certainty which will exclude every reasonable conclusion other than the one arrived at by the jury.....The actionable negligence in the instant case arose only after notice of the escape of gas and a reasonable opportunity to repair.....The defendant (gas company) had opportunity to find the leak and repair it prior to the explosion, but failed to do so."

Legal Interpretation of "All the Oil, Gas and Mineral Rights"

Since almost all of the oil and gas leases contain the clause "all the oil, gas and mineral rights" it is important to observe that in the recent case of Praeletorian Diamond Oil Ass'n v. Garvey, 15 S. W. (2d) 698, the higher Court held this phrase *not* to include clay and gravel rights. This Court said:

"We do not think that the abstract question of whether or not gravel is a mineral is necessary to be determined.... ..The intention of the parties as to what was being conveyed in the lease must be gathered from the four corners of the instrument.....We think it evident, when the instrument as a whole is considered, that it was not the intention to convey gravel. While it is true that the lease recites that 'all the oil, gas and other minerals' are conveyed, still it is manifest from the other provisions that gravel was not included.....The lease has no provisions for the mining of gravel, nor the caring for or disposition of gravel.....We think it is perfectly clear from the face of the lease that only such minerals—oil and gas—as could be and are customarily stored in tanks or transported in pipe lines were contemplated by the parties and intended to be included in the conveyance in the lease."

Therefore, it is quite apparent that unless the testimony clearly indicates that the parties to a lease contract intended that the above term includes sand, gravel, clay and like products, its meaning is strictly limited.

Failure to Sell Gas Does Not Invalidate Lease

In Transcontinental Oil Co. v. Thomas 29 F. (2d) 733, the owner of land filed suit to cancel a lease on the contention that the lessee had made no effort to sell the gas capable of being produced from a well drilled on the property.

The testimony showed that the lessee had paid $12,500 as rent, and had drilled a producing gas well near a river at an expense of approximately $40,000. In the lease contract the lessee agreed to pay the lessor a percentage of the income derived from the well.

The supply of gas was far in excess of the demand in that locality, and well on the opposite side of the river had been developed to a great extent. There had been practically no sale of gas, except by companies owning or controlling pipe lines, on the opposite side of the river. The lessee, against whom suit was filed, had no pipe line and was unable to sell gas at a reasonable price. Moreover, there were no other wells close to the well in litigation. The owner of the land contended that the lessee had violated the contract because he had failed to sell gas from which the former should receive a percentage of the profits, although the contract did not specifically require the lessee to produce income from the well. However, the Court held the lessor not entitled to cancel the lease saying:

"It conclusively appears that the lessee was unable to sell gas because of the lack of a market.....The supply of gas in the well was not depleted, and it was not in danger of being drained by other wells, the nearest of which was located at a distance of about three-fourths of a mile.....The lessee had not suffered the supply of gas in the well to decrease or to be drained by other wells in the gas field."

Gas Company Loses Rights and Drilling Expenditures

Frequently, firms and persons who lease land for the purpose of drilling for oil and gas may encounter heavy expenditures without any rights in the completed wells.

This circumstance commonly occurs where property is donated to some person, church, school, etc., for an exclusive purpose or use.

For instance, in Magnolia Co. v. Suits, 31 F. (2d) 205, it was disclosed that the owner of property deeded it to a church. The deed specified that the property should be used exclusively for church purposes. Later the trustees of the church leased the oil and gas right to a company which proceeded to drill a well.

After a producing well was drilled the heirs of the person, who donated the property for church purposes, sued to recover the oil and gas rights. In holding that neither the church nor the company which drilled the well held title to these rights, the Court said:

"It is evident from the language employed it was the intention of the parties that the grantors conveyed the land for the exclusive use of building a church house thereon. Restrictions as to the use of land by the grantee are enforced and upheld where expressed in clear and certain terms.....They may be enforced against the trustees of the church, as they were under no obligation not to violate the condition or restriction, having accepted the deed or conveyance with such a provision. It may *also* be enforced against the respondents (gas company) who seek to operate under the lease, having taken a lease with notice, either actual or constructive, of the limitation."

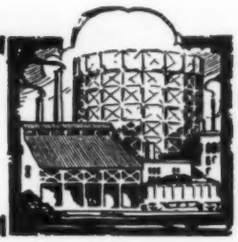
Fourth Short Course in Gas Engineering

Another opportunity is to be offered gas men and their customers to attend a short course in gas engineering at the University of Illinois, Urbana, June 17 to 29, 1929. The course will be known as the Fourth Short Course in Gas Engineering and will be under the direction of Doctor T. E. Layng of the University of Illinois staff.

Industrial Hotel & Restaurant, and House Heating subjects will be handled as usual, but the rudimentary work on combustion, chemistry and physics is to be spread out over a greater number of days than before, thus giving the students more of an opportunity to digest this most important part of the work.

The course is sponsored by the Illinois Gas Association and is under the direction of the following committee: J. D. Preble, The Public Service Co. Chairman; W. B. Swearingen, Central Illinois Light Co.; A. D. Frydendall, The Peoples Gas Light and Coke Company; J. R. Roberts, Rockford Gas Light and Coke Company; and R. D. Hayes, Illinois Power and Light Corporation.

NEWS OF THE GAS INDUSTRY



Work on Atlanta Natural Gas Pipe Line Started

Work has started on the construction of a 22-inch gas pipe line from the Monroe and Richland oil fields in Louisiana to Atlanta, according to an announcement made by officials of the Southern Natural Gas corporation.

A contract has been let to Ford, Bacon and Davis, Inc., for the construction of the pipe line, and a sub-contract has been given Williams Brothers, of Tulsa, Okla., and the Oklahoma Contracting company, of Dallas, Tex., for the building of the western portion of the pipe line, covering approximately two hundred linear miles. The contract calls for the delivery of natural gas to customers in Atlanta not later than December 31, 1929.

The Central Public Service corporation, recent purchasers of the properties of the Atlanta Gas Light company and other Georgia gas companies, has entered into a contract with the Southern Natural Gas corporation for the distribution of its product, and a hearing on this will shortly be held before the Georgia Public Service commission.

Pipe Line to be Built to Ft. Collins, Colo.

Announcement has been made that the construction will start immediately on a one and a half million dollar natural gas pipe line to Ft. Collins, Colo.

The line, which is expected to be completed and in operation by early Fall, will make natural gas available for 30,000 additional Colorado residents and provide a supply of industrial fuel for brick yards, sugar factories, canning plants, potteries and other industrial enterprises in that section.

The line will be built by the Colorado-Wyoming Gas Company, a subsidiary of the Cities Service Company. Announcement of the construction plans were made by Clara N. Stannard, Vice-President and General Manager of the Public Service Company of Colorado.

The line will be 65 miles long. It will be an 8-inch and a 10-inch main. At Ft. Collins, the line will connect with the main of the Colorado-Wyoming Gas Company which extends to Cheyenne, Wyo. The Ft. Collins natural gas field will become an auxiliary unit, capable of supplying Denver in the event of temporary failure on the Denver-Amarillo line. The line will have a capacity of approximately 10,000,000 cubic feet of natural gas daily.

Convention Calendar

June

13-14. Canadian Gas Association, Annual Convention, Ottawa, Ontario. G. W. Allen, Secretary, 7 Astley Ave., Toronto.

17-29 Fourth Short Course in Gas Engineering, University of Illinois. George Schwaner, 205 Illinois Mine Workers Building, Springfield, Ill.

July

1-3 Michigan Gas Association Annual Meeting, Grand Hotel, Mackinac Island, Mich. Albert G. Schroeder, Grand Rapids, secretary.

New Colorado Law Affecting Public Utilities

House bill No. 360 by representative King which provides that only by ordinances the councils of cities of the first and second classes can grant franchises to public utilities, was passed by the Colorado legislature and it received the approval of Governor Adams.

Grants Permission to Issue Stock

The Indiana public service commission has granted the Southern Indiana Gas and Electric Company of Evansville, Ind., permission to issue $500,000 in 6 per cent preferred stock and 100,000 shares of no par value common stock.

Indiana Public Service Commission Appointments

Reappointment of John W. McCardle and the appointment of Jere West of Crawfordsville, Ind., as members of the Indiana public service commission have been announced by Governor Harry G. Leslie. Mr. West will succeed Harvey Harmon of Princeton as a Democratic member of the commission. At a reorganization meeting Mr. McCardle was elected chairman to succeed Frank T. Singleton of Martinsville.

New Water Heating Rate

A new Water Heating Rate has been made effective by the Peoples Gas Light & Coke Co., Chicago, with the consent of the Illinois Commerce Commission. The new rate will be known as Rate No. 2, the demand rate formerly known as No. 2 having been discontinued. Under the new classification gas will be sold at 3½ cents per 100 cubic feet. The service is available only during the period of the year from May 1 to September 30 of each year and only for gas used for heating water. It will be necessary for the customer to sign a regular form of contract which provides for a minimum monthly charge of $15 for the months of June, July and August. Applications for service under the new rate will be taken by the water Heating Division and the Industrial Department. Applications for service received in any other departments of the Company will be referred to one of the above mentioned departments.

The new water heating rate opens up another field for gas. It will give the owners of many big business enterprises: shops, factories, hotels, restaurants and apartment buildings an opportunity to use gas for heating water in large quantities and discover the fact that water heating can be done better with gas.

Company to Serve Customers Over a Wide Territory

Four hundred and fifty members of the gas division of the Georgia Power Company were transferred to the Southern Cities Public Service company when it assumed direct charge of the Atlanta Gas Light company.

Among the more important cities in the South which will be served by the Southern Cities Public Service company are Atlanta, Macon, Augusta, Roanoke, Mobile, Montgomery, Anniston, Gadsden, Meridian, Charleston, Johnson City, Tenn., Pensacola, Key West, Harrisburg, Miss., West Palm Beach and Port Arthur, Texas.

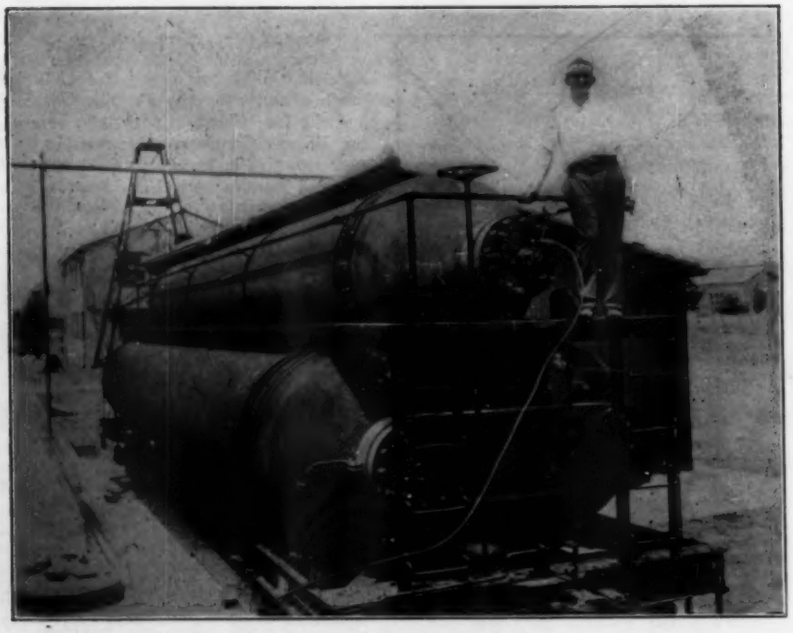
More than 127,000 customers will be served by the company, it is estimated, in cities with a total population of 1,100,000.

Natural Gas Found Near Mooresville, Ind.

Natural gas has been found about five miles east of Mooresville, Ind. The pressure was so strong that it blew the drilling tools from the casing.

New Government Helium Plant Makes Initial Shipment

Shipments of helium from the Government's new helium production plant, near Amarillo, Texas, started May 6, with the dispatching of tank car USQX 201, filled with about 200,000 cubic feet of helium, to Langley Field, Virginia, it is announced by the United States Bureau of Mines, Department of Commerce.



Government specially designed steel tank car for shipping Helium gas.

The new plant, which has been designated as the Amarillo helium plant, was built and is operated by the Bureau of Mines at Soncy, on the Rock Island Railroad about 7 miles west of Amarillo. The helium is extracted from natural gas having a helium content of 1¼ per cent, produced from the Cliffside structure lying northwest of Amarillo. Gas from 26,000 acres of land is available to the plant through a contract between the Department of Commerce and the Amarillo Oil Company.

The helium-bearing natural gas is transported from the wells to the plant, by the natural pressure of the wells, through a welded steel pipe line eleven miles long. In the plant the gas is cooled to a temperature so low that all of the constituents except helium are reduced to liquids. This temperature is approximately that of liquid air and is lower than 300° F. below zero. The helium is drawn off as a gas and the liquids are returned to the gaseous state by allowing their temperature to return to that of the atmosphere. A part of the gas resulting from the evaporation of the liquid is used as fuel to generate power to operate the plant and the remainder is discharged into a pipe line which carries it to Amarillo where it is used as domestic and industrial fuel. The process of extracting helium is a continuous one involving pressures as high as 2500 pounds per square inch.

The car in which this first shipment was made is one of two specially built helium tank cars owned by the Air Corps, U. S. Army. It carries helium under a pressure of 2,000 pounds per square inch. When the car reaches Langley Field the helium will be discharged into other containers for use in the Army's lighter-than-air craft and the tank car will be returned to the Amarillo plant for reloading.

Two New Waterless Holders for Chicago

Construction has been started on two 10,000,000 cubic foot water-less gas holders which will be placed in service some time next Fall, according to a recent announcement of the People Gas Light and Coke Co., Chicago, Ill.

These holders add another link to the Company's facilities in safeguarding its distribution system and offer further assurance of a continuous, uninterrupted supply of gas.

The maximum 24-hour send-out has risen to a new high of 176,735,000 cubic feet. With the addition of these new holders, total storage capacity will amount to 128,000,000 cubic feet, or approximately 72.5 per cent of the largest demand yet made for gas.

Both of these structures will be marked to safeguard aviators. A committee of the American Gas Association is now working out a standard with the Bureau of Aeronautics, and its specifications will be incorporated in construction.

Life Saving Medals Presented to Four

The first annual awards of Midland Utilities medals for life-saving to employees of company were recently made.

Medals and certificates were presented by Samuel Insull, jr., president of the company to the following: Elmer E. Starks, Elkhart, George M. Overlease, South Bend, Alonzo H. Osborne, Lafayette.

A medal and a certificate were also presented to John E. Deegan, of the Kokomo Gas and Fuel Company, which is also a subsidiary of the Midland Utilities company.

The medals, designed by Anthony de Francisci, widely-known New York sculptor, are made of silver. Each of them was presented in a leather case on the outside of which was stamped in gold letters the name of the recipient. Each medal was accompanied by a framed certificate attested to the merit of the life-saving act.

Each of the men who received a medal saved the life of a person who had been overcome by gas during 1928, by the prone pressure method of resuscitation. The plan for an annual award of life-saving medals was established by the Midland Utilities Company last year.

$31,500,000 "Melon" by Columbia Gas and Electric Corporation

Directors of the Columbia Gas & Electric Corporation recently voted what is in effect a $31,500,000 "melon" to the holders of its Common Stock of record June 15, 1929. The directors authorized the offering of 843,284 additional shares of Common Stock of the Corporation for subscription at $24 per share by holders of Common Stock, in the ratio of one additional share for each ten shares held as of June 15. The Common Stock has been selling at around 60 for several weeks following the recent two and a half for one split-up of the shares.

Proceeds from this issue of additional Common Shares will be used, according to President Philip G. Gossler, to reimburse the treasury of the Corporation for advances made to subsidiaries for their construction and other requirements, and for other general corporate purposes.

The Common Stock which is of no par value, is on a par annum dividend basis of $2, the initial quarterly dividend of 50 cents per share being payable May 15 to stock of record April 20. There are 8,432,840 shares outstanding or issuable as a result of the recent split-up.

Bring in Gas Well

The Indian Territory Illuminating Oil Company, a subsidiary of the Cities Service Company, brought in a gas well late in April in the Oklahoma City oil field, making 55 million cubic feet daily.

Authorizes Stock Issue

The Central Public Service corporation has been authorized by the Georgia public service commission to issue 3,000 shares of non par value stock and $241,500 in bonds.

Robert Alston, attorney for the company, explained that the Atlanta gas properties are not involved in the bond issue, the properties effected being the gas companies in Decatur, East Lake, Brunswick and Athens, where extensive improvements are being planned as soon as the bonds have been issued and disposed of.

To Build $1,000,000 Gas Line

Announcement of a new $1,000,000 pipe line into San Antonio, Tex., bringing 30,000,000 cubic feet of gas daily more than the present supply, has been made by E. H. Kifer, vice-president and general manager of the San Antonio Public Service Company.

Contract has been made with the Magnolia Gas Company for an increased supply of natural gas for San Antonio as well as the electric power plants under operation by the local utility concern. Construction on a 90-mile line will start at once, the first 30 miles being of 18-inch pipe and the final 60 miles of 20-inch pipe.

The new contract has been executed to improve the gas distribution in San Antonio so that more industrial firms may have use of this fuel. Since beginning an energetic campaign a few years ago to increase the industrial consumption there, a large number of firms have changed to gas fuel which, with new industries, has created a need for a larger supply.

Construction Activities on Natural Gas Project for Salt Lake City

Natural Gas construction activities and improvements are now moving ahead at rapid speed, according to L. Fitzpatrick, vice-president and general manager of the Utah Gas and Coke Company, Wasatch Gas Company and Ogden Gas Company, who is directing natural gas progress into Salt Lake City and other Utah cities and towns.

The program calls for the immediate construction of town plants, and of supply and service mains, in addition to the completion of the large transmission lines from the extensive Hiawatha and Baxter Basin natural gas fields in Wyoming and Colorado. Work on the town plants along the transmission lines between Ogden and Salt Lake City was started recently. Construction on the Kaysville distribution system is now well under way.

Progress on the large Salt Lake City natural gas belt lines is moving ahead rapidly. The Utah Gas & Coke Company's intermediate high pressure lines now tap the Wasatch Line, which circles the city, at three major city gate points.

A total of 1700 men are now employed in laying the natural gas system of the two local Mountain Fuel Supply Company's from the gas fields to the Salt Lake Valley.

Assume Control of Atlanta Gas Light Company

Ownership and control of the Atlanta Ga. Gas Light company was assumed May 1 by the Southern Cities Public Service Company, a subsidiary of the Central Public Service Corporation, of Chicago, and headquarters for the company were opened in the new Gas Building.

R. C. Hoffman, Jr.

R. C. Hoffman, Jr., formerly of Baltimore, has accepted the vice-presidency of the Southern Cities Public Service Company, and has arrived in Atlanta, where he will make his home. He will direct the operation of gas properties owned by the corporation in 36 Southern cities, with headquarters in the new Gas Building.

Announcement of the personnel in direct charge of the Southern properties has just been made by Mr. Hoffman. M. L. Kane, formerly with the Georgia Power Company, will be manager of the Atlanta Gas Light company, and will direct all service to Atlanta and its suburbs. All properties east of the Alabama-Georgia line, with the exception of those directed by Mr. Kane, will be under the direction of J. W. Gates, who will serve as eastern district manager with headquarters in Atlanta.

Properties west of the Georgia-Alabama line will be under the direction of W. W. Winter with headquarters in Mobile, Ala., while properties in Virginia will be directed by W. J. McCorkindale, with headquarters in Roanoke, Va. The commercial, or sales department of the new company, will be directed by A. C. Crandall,

The Oldest Gas Tank Is Still Standing

The first gas tank ever built is still standing at Smethwick, England, after 121 years of existence. The iron cylinder was erected in 1808 by William Murdock, founder of the manufactured gas industry, and a bronze memorial tablet was recently unveiled at Smethwick by the present gas company in his honor. Murdock died in 1839.

Natural Gas for Indiana Town

Definite announcement has been made in Washington, Ind., that natural gas will be available in that city shortly. Henry A. Nordhelm, manager of the Washington Gas & Coke Company has received from S. W. Newton, president of the Indiana Oil & Gas Corporation, definite assurance of this. The company is just completing the piping of gas to Vincennes and will begin on the Washington work immediately. Construction of the pipe line from the Gibson county gas field is being pushed rapidly and as soon as it reaches the city limits work will begin on changing gas appliances to conform to natural gas.

Laying New Gas Main

A high pressure gas main from the local plant of the Rockford, Ill., Gas Light and Coke Company to Freesport, a distance of 27.4 miles will be started soon, W. S. McMaster, general manager of the local company has announced. A new gas holder will be built at Freeport. The pressure main will be of six-inch steel pipe and upon completion of the line the present Freeport plant will be abandoned, overhauled and then prepared for emergency service. The United Fuel Transportation Company, Chicago, subsidiary of the Central Service Company, holding concern for the local gas utility will be owner of the line. Farmers along the line of the pipe will be furnished gas and intermediate towns will be served from the line also. The work is scheduled to be completed by September 30.

New Gas Holder to be Erected in St. Louis

The Laclede Gas Light Company of St. Louis, Mo., will start soon the erection of a new gas holder of 10,000,000 cubic feet capacity at Natural Bridge and Hamilton avenues to serve a rapidly expanding district. The new holder and pumping station represent an investment of a quarter of a million dollars.

Refrigeration School

Fifty-two Southern California Gas Company and Southern Counties Gas Company salesmen recently enrolled and completed a short course of study in the first gas refrigerator sales school ever held in the West. California Servel, Inc., the western wholesale branch of Servel Sales, Inc., manufacturers of Electrolux Servel gas refrigerators, sponsored the school. A. L. Spring, President of California Servel, Inc., and W. T. Wyatt of the same organization, explained in detail to the salesmen the various phases of refrigeration manufacture.

Instruction in methods of selling gas refrigeration equipment was given and much attention centered around the activities of the Southern California Gas

Company in this field. J. E. Kern, Refrigeration Engineer of the Company, presented a paper on "The Relation Between Sales and Service in Building Refrigeration Sales." Clyde H. Potter, General Commercial Agent of the Southern Counties Gas Company, addressed the school on the activities of his organization in gas refrigeration.

Natural Gas News from Arkansas

The Arkansas Natural Gas Corporation announces the purchase from the Industrial Gas Company of the 16-inch line constructed by the Hunter interests and the 12-inch and 14-inch lines constructed by the Latox Construction Company, connecting the Monroe field to El Dorado and Camden with all their gas sales contracts in that territory including the contract to supply the pulp mill of the International Paper Company south of Camden. A contract was also entered into with the Industrial Gas Company to purchase gas from them in the Monroe field, guaranteeing an ample supply for this line for a number of years.

This line will also be connected with the new 12-inch El Dorado-Emmett line of the Louisiana-Arkansas Pipe-line Company, a subsidiary of the Arkansas Natural Gas Corporation which ties in with the main 18-inch trunk line from Shreveport to Little Rock. This connection makes a complete circuit of the entire gas system of the Arkansas Natural Gas Corporation and subsidiaries and will make possible an arrangement whereby all of the towns supplied by these companies may be served by the major fields of the south.

Announcement has been made of the purchase of the franchise and distribution system owned by the Industrial Gas Company at El Dorado.

Construction will begin soon on a 100-mile 20-inch line from the Monroe gas field to Shreveport. The gas transported through this line will be sold to the Southern Cities Distributing Co., also a subsidiary company to guarantee an ample gas supply for consumption in Shreveport due to the rapid failing of the local supply.

Four Big Gas Wells Brought In

Four gas wells were recently brought in, in the Laredo, Texas district, the initial production being 135,000,000 cubic feet. They are: A. L. Kitselman No. 1, Lopez, in the Henne, Winch and Farris field, 50,000,000 cubic feet; depth of well 1,967 feet. Humble No. 18 Kohler, survey No. 402 Duval county, 25,000,000 cubic feet; depth of well 1,835 feet. Humble No. 21 Kohler, survey No. 396 Duval county, 25,000,000 cubic feet; depth of well 1,854 feet. Killam No. 4 Brunt, in the Cole field, 35,000,000 cubic feet, depth of well 2,882 feet.

Personals

T. W. Halloran has been appointed Gas Heating Engineer for New York Power and Light Corporation. In this position he will follow up particualrly the promotion and installation of home heating installations. His office will be located at Albany.

Mr. Halloran was for the past five years a member of the Utica Gas and Electric Company, first as plant engineer and more recently as gas sales engineer in the Commercial Department.

William L. Butler has been appointed supervisor of the industrial department of the Ogden Utah Gas Company, Utah Gas & Coke company and the Wasatch Gas company according to an announcement by L. Fitzpatrick, vice-president and general manager of the natural gas companies. Mr. Butler as a mechanical engineer has had wide experience in natural gas activities. He is recognized as one of the best qualified engineers in the development of natural gas as a fuel for industrial purposes. He has operated in Pennsylvania, West Virginia, Kansas, Oklahoma, Arkansas, Louisiana, Texas, California, Colorado and now in Utah.

Perry O. Crawford has been recently made President of American Utilities Service Company, with headquarters in Chicago. Mr. Crawford was formerly vice-president and general manager of The California Oregon Power Company.

Charles Manuel Valdes, formerly manager of the industrial gas division and gas sales manager of the Compania Cubana de Electricidad, Havana, Cuba, has been placed in charge of commercial activities of the Porto Rico Gas and Coke Company, San Juan, Porto Rico.

A. H. Thorn, Manager of Industrial Relations of The Peoples Gas Light & Coke Company, Chicago, Ill., has been recently elected Chairman of the Utilities Chapter of the Illinois Children's Home and Aid Society. Mr. Thorn becomes the representative of the Utilities engaged in this work.

Robert M. Searle, President of the Rochester, N. Y. Gas and Electric Corporation, has accepted a place on the Advisory Committee of the Johns Hopkins University on Gas Engineering.

Clare N. Stannard, vice-president and general manager of the Public Service Company of Colorado has been elected a member of the board of directors of the Better Business Bureau of Denver.

L. G. Barnes, who has been associated with the Virginia Public Service Company for five years, has resigned.

Mr. H. P. Woltz has been appointed New Business Manager to succeed Mr. Barnes.

Jerry S. Stover has been appointed sales manager in charge of the new business department and all sales promotional activity of the Utah Gas and Coke Company, Ogden Gas Company and the Wesatch Gas Company, according to an announcement of L. Pitzpatrick, vice-president and general manager, who stated preparations are rapidly being made for the arrival of natural gas. The appointment became effective April 1st and fills the position formerly held by C. L. Bougher.

Mr. Stover has had wide experience in the natural gas industry having been associated with the Lone Star Gas Company of Dallas, Texas, for the past ten years. He has been identified in various branches of field activity as well as the sales and advertising departments of the natural gas industry. During the past few years, Mr. Stover has been engaged in organization and sales promotion of the Community Gas Company of Texas.

N. W. Gifford, after a mutually happy and profitable association with the East Boston Division of the Boston Consolidated Gas Co. for 27 years retired from active service on April 1, 1929.

He first entered the employ of the old East Boston Gas Co. as Superintendent, and after various promotions became President in 1917. When the Boston Consolidated Gas Co. acquired the East Boston Company in 1922, Mr. Gifford became a Vice-President in charge of the East Boston Division. This position he held up to the time of his recent retirement. Mr. Gifford, throughout his business career, has also held several prominent offices in the leading New England gas associations.

Roy E. Chew, for eight years general manager and vice president of the Union Gas and Electric Company of Bloomington, Illinois, has resigned to accept a similar position with the Birmingham, Alabama, Gas Company, subsidiary of the Commonwealth Power Corporation of New York City, effective, May 15. The Bloomington plant has been controlled by the Associated Gas and Electric Company of New York with which corporation, Mr. Chew has been connected for 20 years. He was with the New York office for five years, and later was in charge of plants at Colorado Springs, Col,; Leavenworth, Kansas, and also in North Dakota, coming to Bloomington eight years ago. Mr. Chew's successor in Bloomington is R. J. Rutherford, graduate of the University of Illinois and for the past three years, acting vice-president of the Gas Utilities, Inc., at Columbus, Ohio.

John W. Childress has resigned his position on the Public Utilities Commission of the District of Columbia, of which he is chairman, to accept a post with the newly created United States Lines, Inc. Mr. Childress requested that this resignation become effective on May 31.

Victor Starzenski, Manager of the Schenectady Division of the New York Power and Light Corporation since the organization of the Company in 1927, has been appointed Gas Engineer with headquarters in Albany. Mr. Starzenski assumed the duties of his new position on June 1.

Victor Starzenski

Mr. Starzenski came to Schenectady in July, 1908, as cadet engineer in the old Mohawk Gas Company, of which A. V. Wainwright was the general manager. He had previously worked under Mr. Wainwright when the latter was General Superintendent of Lighting of the Connecticut Company, then a subsidiary of the New York, New Haven and Hartford Railroad Company with properties in Waterbury, New Britain, Suffield, Branford and South Norwalk, Connecticut.

After four years' service, Mr. Starzenski in 1912 was made superintendent of the gas department of the Mohawk Gas Company. In 1916, he was made Assistant General Manager, under Henry W. Peck, of both the Mohawk Gas Company and the Schenectady Illuminating Company. Upon the organization of the Adirondack Power and Light Corporation in 1920, Mr. Starzenski became General Superintendent of the gas department, operating in Schenectady, Saratoga, Glens Falls and Oneida.

The following year, 1921, he was appointed Resident Manager of the Adirondack Company's Schenectady District, continuing in that position until his appointment as Manager of the Schenectady Division when the New York Power and Light Corporation was organized.

Mr. Starzenski has been active in the civic life of Schenectady. He is a director and past president of the Humane Society of Schenectady; a member of the Board of Governors of the Community Chest; past director of the Chamber of Commerce; president and chairman of the operating and finance committees of the Schenectady Airport; a member of the City Planning Commission, and Chairman of the Schenectady Open Forum.

Keith Clevenger, of The Empire Companies, Bartlesville, Okla., became director of publicity and advertising for the American Gas Association, on June 1st, according to an announcement made by Oscar H. Fogg, President of the American Gas Association.

Mr. Clevenger was director of information service for the Empire Companies, a subsidiary of the H. L. Doherty organization. In this position he has directed public relations, publicity and advertising, customer ownership, stockholders' service, and other activities.

Keith Clevenger

In making the announcement of Mr. Clevenger's appointment, Mr. Fogg said: "We are indeed pleased to announce the selection of Mr. Clevenger for this important position at American Gas Association headquarters. He brings to the organization a wealth of varied experience that will be of untold value to the entire gas industry of North America. Mr. Clevenger has long been a prominent and active figure in the gas industry, and his advice and assistance have often been sought for committee and convention activities."

Mr. Clevenger was born in Yates Center, Kansas, on Jan. 14, 1887. He is a graduate of Kansas University, class of 1909, with the degree of LL.B. From 1910 to 1919 he was editor and owner of the *Osawatomie Graphic,* Osawatomie, Kansas. In January, 1919, he became managing editor of the Salina, Kansas, *Daily Union.* He was later made advertising manager of the *State Farmer's Union,* at Salina, and in 1920 became manager of the Kansas State Chamber of Commerce.

In 1921, Mr. Clevenger organized and directed the public relations department of the United Light and Power, United Telephone, and Associated Companies, with headquarters at Abilene, Kansas. In June, 1923, he became director of public relations for the Cities Service Gas Co., at Bartlesville, Okla., and served in this capacity until September, 1927, when he assumed the duties of his recent position with the Empire Companies.

Conrad N. Lauer has been elected a vice president of The United Gas Improvement Company and president of The Philadelphia, Pa. Gas Works Company, to succeed Paul Thompson, retired after more than thirty years in U. G. I. service. Mr. Lauer also has been appointed a member of the Philadelphia Gas Works Commission succeeding Mr. Thompson.

Mr. Lauer, who has been vice president of Day & Zimmermann, Inc., for several years, has a country-wide reputation as an industrial engineer. He was educated in public and private schools in Montgomery County and received his technical training under private tutors. In 1893, he entered the employ of the Link Belt Company where he advanced to plant superintendent. In 1902, he became associated with Dodge and Day, and with its successor companies, Dodge, Day & Zimmermann, and Day & Zimmermann, Inc., has served as general manager, member of firm, secretary, treasurer and vice president.

Conrad N. Lauer

During the World War Mr. Lauer served as chairman of the Industrial Committee in Philadelphia, for the second and third Liberty Loan Campaigns, and was actively identified with this work for the fourth and fifth campaigns. During the War period he also was in charge of important construction work at Erie and Philadelphia under Government contracts.

Mr. Lauer is the author of "Engineering in American Industry" in which he traces the development of some of the more important American engineering

contributions to the industrial development of the race.

Andrew J. Wallbillich has been appointed Appliance Sales Supervisor of the Albany District of the New York Power & Light Corp. He succeeds Theodore P. Federer who has held this position since the formation of the New York Power and Light Corporation and who has been transferred to The Syracuse Lighting Company, Inc., to take up a similar position.

As Supervisor of Appliance Sales, Mr. Wallbillich will have charge of the Company's local merchandising department, which includes the sale of domestic and other appliances, both gas and electric, as well as the recently organized home service department intended to advise customers in the most efficient and effective use of home appliances. His territorial assignment in addition to Albany includes Rensselaer, Greenbush, Delmar, Slingerlands, Voorheesville, Altamont, Loudonville, Lathams, Menands, and intervening territory.

R. H. Bergren, formerly manager of the Chicago office of R. M. Grant and Company, has become associated with the municipal bond department of H. M. Byllesby and Company, it is announced by J. G. Sheldon, manager of that department.

E. A. Ravencraft, for the last three years commercial manager at Danville, has been appointed head of the merchandise department of The Kansas Power and Light Company at Topeka.

His position at Danville has been taken by O. G. Robertson, who has been in the sales department there for the past two years.

Elmer J. West, Jr., was appointed Resident Manager of the New York Power & Light Corp., Cobleskill, N. Y., taking up duties of W. J. Fox, who resigned. Mr. West was formerly located at the Company's headquarters in Albany, where he was Supervisor of Appliance Service for some time.

Walter Thomas, former superintendent of the gas plant of the Wisconsin Power & Light Corp., Fond Du Lac, Wis. has gone to Rochester, Minnesota, to take a position as superintendent of the Gas Department of the local utility in that city. L. Ridgeway has been promoted to the position vacated by Mr. Thomas.

George W. Ratcliffe, President of The Manufacturers Light and Heat Company, Pittsburgh, Pa., has been named a member of the natural gas advisory board established by the School of Mines and Metallurgy, Pennsylvania State College. The natural gas advisory board and one established for petroleum are the first such groups in gas and oil production engineering to be inaugurated by any state college or university. The boards will assist the college in working out various problems of the School of Mines so that the college may better serve these two important industries of the State.

Walter H. Sammis recently took up his duties in the New York office of the Allied Power and Light Corporation where he is now Assistant to T. A. Kenney, Vice-President of that Corporation, a former official of Consumers Power Company. Mr. Sammis has been Assistant to General Manager C. W. Tippy since 1925.

In 1920 Mr. Sammis first joined Consumers organization and has been a part of it since, except for one year spent in the employ of the C. H. Tenny Company of Boston.

Arnold E. Kriegsmann has been named to succeed Mr. Sammis as Assistant to Mr. Tippy.

John J. O'Brien was recently elected President of the Philadelphia Company. Pittsburgh, Pa., and Frank R. Phillips, a director. It was announced that at the next meeting of the board of directors Mr. Phillips would be elected vice-president and general manager. Since the resignation of A. W. Robertson, formerly president of the Philadelphia Company to become chairman of the board of the Westinghouse Electric & Manufacturing Company some months ago, the presidency of the Philadelphia Co. has been vacant. Mr. Phillips, who has been vice-president and general manager of the Duquesne Light Company and vice-president of the Equitable Gas Company, in his new position becomes chief executive officer of the Philadelphia Company and Subsidiaries. In this capacity it is understood that he will exercise all of the operating duties heretofore devolving upon the president. The principal subsidiaries of the Philadelphia Company are the Duquesnes Light Co., Pittsburgh Railways Co., Equitable Gas Co., Pittsburgh Motor Coach Co., and Allegheny County Steam Heating Co.

John J. O'Brien

John J. O'Brien, the new president of the Philadelphia Company resides in Chicago and is president of the Standard Gas and Electric Company, the utility system of which the Pittsburgh companies are a part.

Mr. Phillips is a nationally known figure in the public field. He has been connected with the utilities in Pittsburgh for the past 19 years.

H. H. Ganser, regional vice president of the Philadelphia, Pa., Suburban-Counties Gas and Electric Company, was recently elected president of the Norristown Chamber of Commerce at the annual meeting of that organization.

George Matthews was recently appointed Assistant Resident Manager of the Troy District of the New York Power and Light Corporation. Mr. Matthews will be assistant to Mr. Henry C. Shields, Vice-President and Resident Manager. He has had a wide and active experience in public utility operations covering a period of 18 years, most of which was gained with the Henry L. Doherty organization.

L. K. Langdon of The Union Gas & Electric Co., Cincinnati, O. was elected President of the Ohio Gas & Oil Men's Association at the ninth annual convention recently held at Columbus, Ohio.

Dan M. Levan, superintendent and assistant general manager of the Savannah, Ga. Gas Company, has been promoted to manager of the Jacksonville, Fla., Gas Company, which is controlled by the same interests. Mr. Levan has been with the Savannah Gas Company for nine years.

S. A. Lipscombe, who has been New Business Manager of the City Light & Traction Company, a Doherty property at Sedalis, Missouri, for the past ten years, has been apointed New Business Manager of the Arkansas Gas & Fuel Company at Little Rock.

Clarence Waring, Chief Engineer of the Kansas City Gas Company and the Wyandotte County Gas Company, recently was elected President of the Kansas City, Kans., Chamber of Commerce at the annual meeting of this group.

Seba Cox, foreman, Lansing, Mich., District of the Consumers Power Company was presented with the McCarter Medal for resuscitation of a baby who was apparently choking to death. He applied the Prone Pressure Method.

R. K. Murdock, Superintendent of Street Construction of the Kansas City, Mo., Gas Company, recently won the first prize of $25.00 in the Doherty News Photo Contest. His photograph consisted of a construction crew of the Kansas City Gas Company placing a 16-inch pipe on the A-S-B Bridge, on the line to North Kansas City.

Obituary

F. A. Stacey Dies

F. A. Stacey, a Director of the Stacey Manufacturing Company, died at Chillicothe, Ohio on May 18th at the age of 84 years. He was an organizer and active director of the Savings Bank Company of Chillicothe, President of the Central National Bank, President of the Chillicothe Gas Light & Water Company, President of the Chillicothe Bottling Works, President of the Red Wing Corporation, Dayton, Ohio and President of the Sandy River Coal Company of Kentucky.

Mr. Stacey was born in London, England August 21, 1845 and came to this country at the age of five. During his early years he was actively engaged in the Gas Holder business with The Stacey Manufacturing Company, Cincinnati, Ohio, which his father, George Stacey, founded in 1851.

Trade News and Construction

Collins Retires

On June 1st, Mr. David J. Collins retired as active head of the Gas Sales Department of the U. G. I. Contracting Company division of United Engineers & Constructors, Inc., and will devote most of his time to his personal interests. Mr. Collins will continue to act in a consulting capacity for the Company on gas sales problems and will handle special situations for them.

For forty-seven years, Mr. Collins has been one of the most active and well known figures in the gas industry—the head and shoulders of the U. G. I. campaign in the gas construction field. As befits a man with his long record of accomplishment, he passes on to others the active participation in construction sales affairs, while giving the Company the benefit of his advice matured through many years of personal contact and experience.

Carl A. Schlegel Appointed Sales Manager

Mr. Carl A. Schlegel has been appointed Sales Manager of the Gas Department of the U. G. I. Contracting Company division of the United Engineers & Constructors, Inc.

Mr. Schlegel's entire business career has been with the U. G. I. interests where he has rounded out an experience touching all phases of the gas industry. Graduating from Stevens Institute in 1910, as Mechanical Engineer, he entered the engineering and construction branch of the United Gas Improvement Company. In 1915 he was made engineer and manager of the Northern Indiana Gas & Electric Company at South Bend, Ind., leaving in 1915 he was made engineer and manager Upon his discharge from the army at the end of the war, he returned to the U. G. I. Contracting Company and was placed in charge of the Estimating Department. For the last five years he has devoted himself exclusively to sales work.

United Engineers & Constructors, Inc., Activities

There is being furnished and installed a new generator together with firebrick linings, Chrisman Cycle and air and steam controls on the existing carburetted water gas apparatus at the Barre plant of the Vermont Lighting Company.

Hudson Valley Coke & Products Company is adding a U. G. I. Waste Heat Boiler to its plant equipment in Troy, N. Y. This boiler will be connected to carburetted water gas apparatus now installed.

Following closely upon the completion of the International Combustion Engineering Corporation's large plant at New Brunswick, N. J., that company has again awarded a contract for a duplicate producer plant to be installed at Coatesville, Pa. The installation will include two U. G. I. Producers, each 10′ 6″ in diameter, together with 14 ft. Cyclone Dust Arrester, operating floor and all auxiliary equipment.

Consumers Gas Company has placed contracts for the furnishing delivering and installing of 21,736 ft. of 8″ and 4912 ft. of 4″ welded steel main, also 10,473 ft. of 2″ screwed joint main at Topton, Pa., which is part of the territory served by the Consumers Gas Co.

The distribution engineering department is laying approximately 7200 ft. of 12″ welded steel main and approximately 14,000 ft. of 8″ welded steel main in Chester, Pa. The work was awarded by the Philadelphia Suburban-Counties Gas & Electric Co.

The Iowa Railway & Light Corporation is having furnished for the Marshalltown plant one of the U. G. I. High Duty Gas Condensers, together with by-pass connections and valves.

Brown Instrument Company Moves Boston Office

The Brown Instrument Company, Philadelphia, Pa., has moved its Boston office from 161 Devonshire Street, Boston, Mass., to 1107 Public Service Building, 89 Broad Street, in the same city. This change has been made necessary by the need of larger quarters due to the rapid growth of the company's business in the New England territory.

Home Incinerator Company Acquires Jos. Goder & Staff

The Home Incinerator Co., Milwaukee, Wis., manufacturers of gas-fired incinerators for garbage and waste disposal, whose product is known to the gas fraternity as "INCINOR" announces the acquisition of Jos. Goder & Staff, Chicago, Ill., designers of special types of incinerators for the past 20 years, covering a wide range of applications.

Mr. Arnold A. Naulin, President of Home Incinerator Company, states that with this acquisition, the Home Incinerator Company is in a position to meet every requirement for the disposal of garbage and waste for homes, hotels, clubs, hospitals, clinics, institutions and industrial plants.

The capacities of INCINOR "brick-set" types run from 175 lbs. per hour, up.

Mr. Naulin states that they will have a staff of engineers make proposals on each installation from surveys of prospective purchasers requirements and will recommend the type of INCINOR "brick-set" best fitted to meet each case.

INCINOR "brick-set" types will be erected on the premises, under supervision of INCINOR erection superintendent in accordance with proposal and detail drawings furnished, and whenever possible in cooperation with local gas company's industrial engineering department. This new INCINOR "brick-set" line opens a wonderful, new and profitable field for splendid increased gas load, most of which will be off-peak.

Details on INCINOR "brick-sets" are set forth in a new catalogue No. A 202 just issued by the Home Incinerator Company. Copy will be sent on request.

Quigley Furnace Specialties Co., Now in Larger Offices

In line with the general trend toward the new uptown industrial and business center, the Quigley Furnace Specialties Co., manufacturers of high-temperature cements, protective coatings and other industrial products, has moved its main office to the "Heart of New York," where other prominent engineering concerns are locating.

The old offices were at 26 Cortlandt Street; the new headquarters and research laboratory occupy the entire eighth floor of the Lakner Building, 56 West 45th Street.

To celebrate the milestone in its history the Quigley firm is mailing out a convenient guide map of the "Heart of New York," showing theatres, stores, hotels, etc.

Contracts Received by Koppers Construction Company

The Rainey-Wood Coke Company has contracted for the design and erection of a battery of by-product coke ovens consisting of 41 Becker Type Combination Coke and Gas Ovens. The new work will

also include three Koppers Gas Producers for underfiring these ovens.

The 41 ovens will have a daily coal carbonizing capacity when operating under normal conditions of approximately 770 net tons of coal.

When underfired with producer gas, these ovens will have a gas output of approximately 8,200,000 cu. ft. of coke oven gas per day.

The Providence Gas Company of Providence, Rhode Island, has contracted for the design and erection of one battery of by-product coke ovens consisting of twenty-five of the Koppers Construction Company's Becker Type Combination Coke and Gas Ovens.

These ovens have a capacity when in normal operation of 515 net tons of coal per day and when underfired with producer gas their oven gas output will be approximately 5,500,000 cu. ft. per day.

Western Gas Construction Company to Erect Gas Machine at Moline—Other Contracts Received

The Peoples Power Company of Moline, Ill., has awarded a contract, consisting of a new 10′ diameter Generator, complete with lining to replace an 8′6″ generator on one of their gas machines.

The Sheridan Gas, Oil and Coal Company of Sheridan, Indiana has awarded a contract for two (2) High Pressure Tanks.

The Zenith Furnace Company of Duluth, Minn., has ordered a quantity of 24″ Steel Welded Pipe and Fittings for use in connection with their recent additional holder capacity.

The Illinois Steel Company of Chicago recently placed an order consisting of 36″ Valves for installation at their South Chicago plant.

The Northern Indiana Public Service Company of Hammond, Indiana has recently awarded a contract covering a 1,000,000 cu. ft. Gas Holder with connections for erection at their plant at Lafayette, Indiana.

A contract has been awarded by the Indiana By-Products Coke Company, of Hammond, Indiana, a subsidiary of the Northern Indiana Public Service Company, for a Liquid Purification and Gas Dehydration plant.

This plant will have a capacity of 3,000,000 cu. ft. of gas per day, and will be designed for 100 pounds gas pressure, and to operate on refinery still gas.

Gas Refrigeration Goes on the Air

The merits of gas refrigeration presented in playlet form are now to be heard each Wednesday morning over the National Broadcasting Company system from station WEAF, New York City. On May 15 at 10:30 o'clock Eastern Daylight Saving Time the Electrolux Players

made their air debut in a domestic skit heard from 16 important stations throughout the country. Sponsored by Servel Sales, Inc., these playlets will continue a regular weekly feature of the National Home Hour, a bi-weekly program which in the past few months has built up a following among the nation's housewives.

Although there is no continuity planned for the programs, the same characters will appear throughout the series. The initial playlet will introduce George and Mil Patterson, a young married couple living in the suburbs who occasionally differ, particularly on such subjects as the sourness of the cream, the softness of the butter and why must the vegetables be wilted and the drinking water warm.

Each playlet has been written to get across in the form of entertainment, the salient facts about the Electrolux, such as its economy of operation, its silence, the fact it has no machinery or moving parts requiring attention and occasional repair. These broadcasting features will be heard from these stations; WEAF, New York; WEEI, Boston; WTIC, Hartford; WJAR, Providence; WTAG, Worcester; WCSH, Portland, Me.; WFI, Philadelphia; WRC, Washington, WGY, Schenectady; WGR, Buffalo; WCAE, Pittsburgh; WEAR, Cleveland; WWJ, Detroit, WSAI, Cincinnati; WHO, Des Moines; KFKX, Chicago.

Westmoreland Coal Company Moves Offices

The Westmoreland Coal Company announced the removal of their offices to 2500 Fidelity-Philadelphia Trust Building, 123 South Broad Street, Philadelphia, Pa., on May 25th.

The Stacey Manufacturing Co. Awarded Contract for Holder at Niagara Falls

The Stacey Manufacturing Company, Cincinnati, Ohio, has just received contract for the installation of a 1,000,000 cu. ft. capacity three lift holder at Niagara Falls, N. Y.

They now have under construction 500,000 cu. ft. capacity holders at North Adams, Mass., Jacksonville, Illinois, Freeport, Illinois, a 1,000,000 cu. ft. capacity holder at Houston, Texas, a 1,000,000 cu. ft. capacity holder at Windsor, Ontario, Canada, a 3,000,000 cu. ft. capacity holder at Racine, Wisconsin, in addition to several purifier installations and a number of high pressure Gas Holders in various localities. Recently, they received contract for the erection of a 3,000,000 cu. ft. capacity holder at Duluth, Minnesota.

The Stacey Bros. Gas Construction Company Awarded Large Holder Contract

The Stacey Brothers Gas Construction Company, of Cincinnati, Ohio, has been awarded the contract for a 10,000,000 cubic foot gas holder by the Pacific Gas & Electric Company for erection in San Francisco, California.

This will involve 5,000 tons of steel and is a duplicate of the holders erected by that company for the City of Long Beach, California, last year and for the Iroquois Gas Corporation at Buffalo, New York, the previous year.

The Stacey Brothers Gas Construction Company report execllent business, and are building holders in Panama and in a great many of the States.

GREFCO

For long-life furnace linings

Where there is a heavy slagging action and temperatures as high as 3400° F., GREFCO Chrome High Temperature Cement will give you most satisfactory results. Consider these advantages:

1. Highly resistant to fuel ash, slags, metallic oxides and metals.
2. Fusion point over 3400° F.
3. Firm set from air temperature to highest heat.
4. Shipped dry, not attacked by the atmosphere.
5. No special preparation required. Can be trowelled, dipped and used just as easily as fire clay mortar.
6. Stays in suspension, does not settle in the mortar box.
7. Can be used with all types of refractory guns.
8. Equally suitable for laying up brick, surface coating, patching and general repair work.

GREFCO can increase furnace lining life and reduce refractory costs for you, as it has for many other concerns. Ask for details.

GENERAL REFRACTORIES COMPANY

106 South 16th Street, Philadelphia, Pa.

District Offices: Boston Buffalo Chicago Cleveland Detroit New York Pittsburgh San Francisco
Seattle, Wash. (Representative—F. T. Crowe)
Montreal, Canada (Representative—Webster & Sons, Ltd.)
Havana, Cuba (Representative—Woodward & MacMillan)

2674

Successful Production Conference Held at Baltimore

Water-gas, coal-gas, and chemical problems of gas manufacture critically analyzed at well attended A.G.A. meeting.

Editorial Staff Report

APPROXIMATELY 400 engineers and chemists participated in the highly successful Production Conference of the American Gas Association at Baltimore, Maryland, May 27 to 29. The three days of the meeting were crowded with worth while material on water-gas, coal-gas, and chemical problems of the industry. The gathering was under the auspices of the three corresponding committees of the Technical Section of A. G. A., and the meetings were presided over in turn by the chairmen of these three committees.

More than usual emphasis was given to the chemical and chemical-engineering aspects of gas-making, not only in the two sessions for which the Chemical Committee was responsible, but also throughout the other meetings. Subjects considered by this group ranged all the way from recommended works-laboratory selection of books to the fundamental questions of laboratory technique, materials evaluation, boiler-water conditioning, and waste-product disposal. Correspondingly excellent programs were presented by the two sessions under the auspices of the Carbonization Committee, special interest attaching to the report by Mr. S. B. Sherman, of Racine, Wisconsin, on the new vertical chamber oven plant operating in that city.

Perhaps the most surprising development of the Conference was the striking evidence of renewed interest of the entire industry in water-gas making. The quantity of water-gas manufactured during the recent years has declined somewhat and many have assumed that this method of gas-making was to be largely supplanted by base-load coal-gas plants. This conclusion, however, can well be seriously questioned in the light of the exceedingly important reports made on various phases of water-gas manufacture. Some of the results reported by the Water-Gas Committee proved so important that substantially all of the rest of this review of the Conference is devoted to the summarization of the conclusions presented.

Automatic Water-Gas Operation

With the cooperation of operating engineers in various plants which have used automatic water-gas equipment, a subcommittee on mechanical grates and automatic charging machines, under the chairmanship of A. H. Schaaf, of Brooklyn, made a resume of some recent results. The advantages and difficulties of operation were reported in considerable detail by the sub-committee which reviewed work at Baltimore, Minneapolis, Chicago, and Brooklyn. The results obtained at one of these plants and summarized in the committee report seem generally typical of the conclusions drawn by the various engineers who have worked with charging and automatic clinkering machines. This summary indicated the following points:

"The increase in oil efficiency which is claimed for the use of automatic chargers is not very prominent in plants operating 100 per cent automatic equipment; the oil efficiency is about the same or very slightly lower in some cases. The fuel per M is lower by from 0.5 to 3 lbs., depending upon the quality and kind of fuel used. The maintenance costs vary from about 15 per cent to 100 per cent more for automatic equipped sets. The increase in production, which is the function of the cleaning time required and the kind of fuel used, varies from 7 per cent to 25 per cent. The net saving per year per machine varies from $5,000 to $17,000. There are other advantages which accompany the installation of grates and chargers, the most important of which is cleanliness."

Discussion from the floor emphasized the fact that the automatic equipment is a new tool in gas-making which is not yet thoroughly understood and hence not as efficiently applied as it may be subsequently. It was pointed out that in some

(*Continued on page 74*)

Solving heat problems were the order of the day for the Production men

COOKS WITH THE GAS TURNED OFF

GRAND PRIZE
An exclusive award to The Chambers Mfg. Co., in competition with all ranges exhibited at International Exposition in Paris, 1928.

Making gas customers stick

Isn't it true that people in moderate circumstances who buy electric ranges keep on using their ranges, whether they like them or not, simply "to protect their investment"?

On the other hand, people who buy ordinary gas ranges can be easily switched over to electric because their gas range investment is small.

We contend that it is good business for a gas company to push the sale of a range like the Chambers,—good business for two reasons.

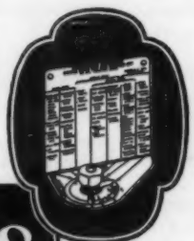
First: because the Chambers is the only gas range that is successfully combatting electric range arguments. The Chambers not only meets but excels this competition by providing the desirable qualities of both the electric and the gas range,—and for full measure certain advantages that no other range of any type can lay claim to.

Second: because the Chambers is not a low priced range. The very nature of its construction and service forbids a low price. From the gas company standpoint that means that the purchasers of Chambers Ranges are out of the market for any other range for many years to come. They are sure to remain patrons of the gas company. Fortunately Chambers users are satisfied users, — they do not want any other range, regardless of the investment involved.

These are facts, plainly stated. They are vital facts to gas men. We will take pleasure in submitting statements made by gas company managers in order to convince you on each and every point.

The **CHAMBERS MANUFACTURING CO.**
33 Columbus Park *Shelbyville, Indiana*

Originators of the insulated gas range, the Thermodome and the Autostat



The Autostat takes the guess out of cooking. It shuts off the gas completely at exactly the right time so that cooking is completed on stored heat. An exclusive Chambers feature.

Chambers
AUTOSTAT GAS RANGE

Production Conference

(*Continued from page 72*)

cases detailed care in supervision of automatic equipment may have been neglected because of the automatic nature of the devices. This, according to one speaker, may account for the lack of anticipated benefits in oil consumption. The same speaker pointed out, however, that the machine is essentially a labor saver and not a fuel saver.

With clinkering time reduced or eliminated by automatic grates new problems have arisen with reference to checker brick it was brought out. Because there is practically no idle time on an automatic set, there is no scurfing effect to burn the carbon from the checker brick during cleans. Also, it was pointed out that the effect of accumulations of dust on the checker brick may be more serious with automatic machines. If there be such dust as carbon accumulation it would account for low oil efficiencies. It was pointed out also that still further benefits from automatic machines may be had from elimination of water cooling in the clinkering equipment, as some of this equipment in its newest forms does not require the use of water. Complete elimination of water cooling would result in the saving of a pound or more of solid fuel per M of gas made.

Bituminous Water Gas

The most significant comment offered on the use of bituminous coal for generator fuel was presented in the sub-committee report under E. L. Fischer, of Davenport, Iowa. The following paragraphs from Mr. Fischer's communication to the conference appear to summarize the present opinion on this subject.

"Some few years ago, I heard someone say that when anyone would show him how to operate with bituminous coal so as to obtain the same set capacity, at less cost for fuel and oil, without smoke, and produce a gas with not to exceed 10 or 12 per cent (I have forgotten the actual percentage mentioned) inerts and without increased gravity, then he was ready to take up soft coal provided the additional maintenance did not exceed the savings. I was not then and am not now prepared to show him how to operate in that manner. The only ones of his requirements which we cannot meet, however, are the low inerts and gravity requirements. Those could be met, but only at the sacrifice of some of the other requirements.

"As to set capacity we can so operate as to exceed normal coke capacities on any size machine. This would require, however, a liberal use of the blow run. With normal blow run (12 to 18 per cent nitrogen) capacities in sets of 7 ft. and below will equal or exceed normal coke capacities. In sets larger than 7 ft. the capacities will be somewhat under coke capacities.

"The costs of fuel and oil when using coal as compared to coke depends, of course, on the relative cost of coal and coke for the particular plant considered. With normal use of the blow run and a good grade of coal, the fuel per M will often be less than with coke and oil about the same. This would indicate that we could make some slight saving with coal and coke prices the same and that with coal prices considerably under coke prices very substantial savings can be made. Many of our plants show a reduction in fuel costs of almost 50 per cent by the use of coal.

"The production of smoke is with careful operation limited to slight amounts during the charging periods and to considerable amounts while bringing in a cold machine. Where this latter is objectionable, we follow the practice of bringing the set to operating temperatures with coke fuel and then proceeding with 100 per cent coal.

"The question of inerts is one on which great differences of opinion exist. A discussion here on the evils or lack of evils of inert gases would be out of place. Suffice it to say that we do not consider the presence of inert gases to be detrimental to good gas service so long as the B.t.u. of the gas delivered is up to standard.

"Where mixing of water gas with lower gravity gas, such as coke-oven or other coal gas, is done, higher gravity is unquestionably to be avoided and it may very well be that this item alone may be sufficient in such plants to eliminate the use of soft coal. However, where water gas is the sole gas supply, the question of gravity is only important in its effect on distribution capacities. In most cases, the gravity increase will be found so slight as to render this loss in distribution capacity negligible."

Another sub-committee of the Water-Gas Committee has given special attention to the question of bituminous coals which have been reported as suitable for water-gas making. Up to May 15, the following coals have been listed as reported by one or more operators as having been used successfully for such purpose:

Argyle—Mines 1 and 2—Huchinson Coal Co., Fairmont, W. Va.

Amherst—Mines 1, 2, and 4—Amherst Coal Co., Charleston, W. Va.

Boone Chilton—Mines 2, 10, and 12—Boone County Coal Corp., Charleston, W. Va.

Blue Star—Birch Fork and Seng Creek Mines—Truax Traer Coal Co., Chicago, Ill.

Cavalier—Jenkins and McRoberts Mines—The Consolidation Coal Co., New York, N. Y.

Diamond—Opperman Coal Co., Charleston, W. Va.

Energy—Franklin County Coal Company, Chicago, Ill.

Fleming—Elk Horn Coal Corporation, New York, N. Y.

Georges Creek—Hooper Mankin Fuel Co., Huntington, W. Va.

Greatheart—Peabody Coal Company, Chicago, Ill.

Hillman—Hillman Coal Company, Pittsburgh, Pa.

Hi-Lo—South Coal and Coke Company, Cincinnati, Ohio.

Kentucky Blue Bell—Cars Fork Coal Company, Portsmouth, Ohio.

Logan Chilton—Lundale and McGreggor Mines—Logan County Coal Corporation, Cincinnati, Ohio.

Little Creek No. 19 Mine—West Virginia Coal & Coke Co., Huntington, W. Va.

Manco—Peabody Coal Company, Chicago, Ill.

Red Parrot—North American Coal Corporation, Cleveland, Ohio.

Orient—Chicago, Wilmington & Franklin Coal Co., Chicago, Ill.

Perkins—Bowling—Southern Coal & Coke Company, Cincinnati, Ohio.

Roda—General Coal Co., Philadelphia, Pa.

Red Dragon—Middle West Coal Co., Cincinnati, Ohio.

Wayland—Elk Horn Coal Corporation, New York, N. Y.

Wheelwright—Elk Horn Coal Corporation, New York, N. Y.

Gas Making with Propane and Butane

The sub-committee on utilization of propane and butane, under the chairmanship of P. E. Eddy, of Chicago, outlined four ways in which these natural-gasoline by-products may be employed in city-gas making. The four distinct applications include:

(1) As a carbureting material in place of oil; (2) to meet peak loads; (3) for distribution when mixed with air; (4) re-enriching on branch feeder lines to make up B. t. u. losses in compression and condensation.

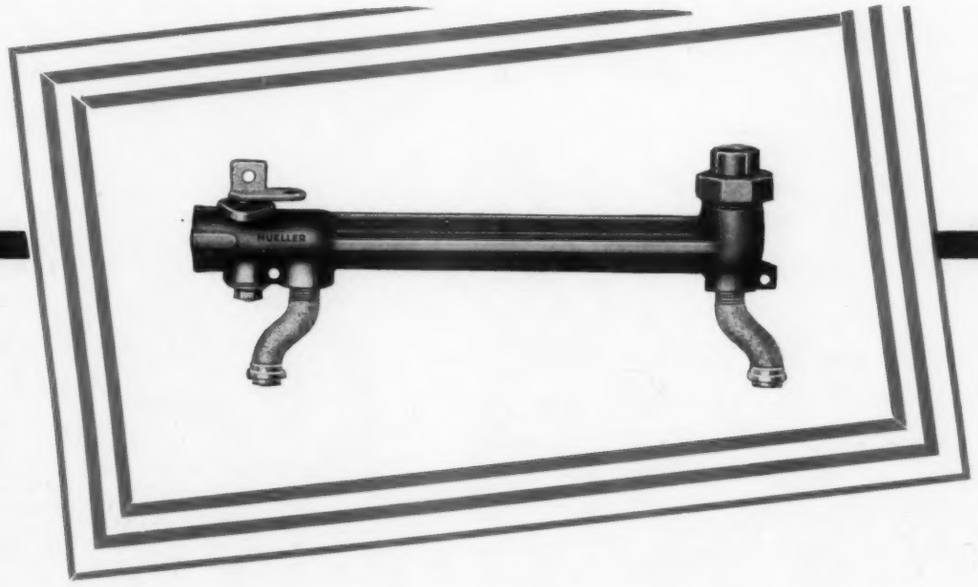
The use of these materials as enrichers in place of oil has been carried out at Davenport, and the sub-committee summarizes comparative results for oil enrichment and butane enrichment with two months of operation in that plant, the solid generator fuel in both cases being Ziegler coal from Illinois. The comparative data presented were as follows:

	March **Oil**	*May* **Butane**
Generator fuel, lbs. per M	35.9	33.8
Enricher, gallons per M	2.92	2.93
Make per set-hour in cu. ft.	86,000	79,600
B.t.u. of gas per cu. ft.	545	540
Boiler fuel, pounds per M	7.6	3.8

From these data and other operating experience, it is concluded that commercial butane can be substituted for gas oil under conditions like those at Davenport with approximately equal cost when the two enrichers are equal in price per gallon. Satisfactory means for handling and injecting the butane have been worked out so that the comparison now becomes largely one based on the relative cost of the materials.

At Louisville, Kentucky, the use of propane-butane mixtures has been developed in conjunction with the other equip-

(*Continued on page 79*)



They fit—*every time*

The care with which Mueller Rigid Bar Meter Hangers are made is an economy in the protection and maintenance of gas meter equipment.

The design gives them the greatest possible strength without making them cumbersome. Bars are cast in the best grade of gray iron obtainable.

Through the many machine operations to the final air-pressure test, all work is done on special jigs designed by Mueller to obtain the highest precision.

Inspection starts at the casting and Mueller quality is maintained at all costs. The slightest defect is enough to scrap the piece.

As a result Mueller Rigid Bar Meter Hangers save time, trouble and prevent leaky installations.

They are made in standard types to meet every need of the gas industry. Write us today for complete information.

Mueller Co. (Established 1857) Decatur, Illinois. Branches: New York, Dallas, San Francisco, Los Angeles; Canadian Factory: Mueller, Limited, Sarnia.

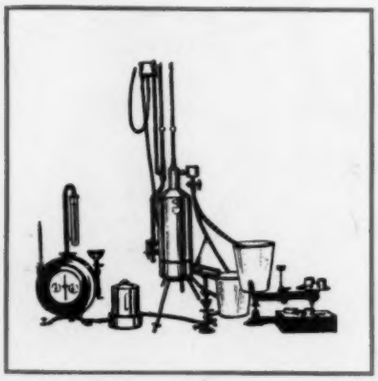
MUELLER

PLUMBING BRONZE AND VITREOUS WARE

In Proving Room Equipment

The Apparatus Department of American Meter Company factories is equipped to furnish Meter Provers in any required size. Their accuracy is vouched for by calibration with the Cubic Foot Bottle certified by the U. S. Bureau of Standards.

Prompt service, intelligent cooperation and complete information is at all times available.



The Improved American Calorimeter

This thoroughly accredited instrument is unsurpassed for determining accurately the calorific values of gas. In the many laboratories where the American Calorimeter is being used, it is prized as an indispensible part of accurate equipment.

STANDARD SIZES WITH BRASS TANK AND COPPER BELL

2-foot prover (No. AL 12)
5-foot prover (No. AL 13)
10-foot prover (No. AL 14)
20-foot prover (No. AL 15)

Other required sizes are manufactured on order—including the 100-foot prover illustrated.

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AMERICAN METER CO. MEASUREMENT ENGINEERS CUBIC FEET

Literature and other information available on request.

Proving room equipped with 23 standard American Meter Company provers in 2-foot, 5-foot and 10-foot sizes.

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AMERICAN METER COMPANY
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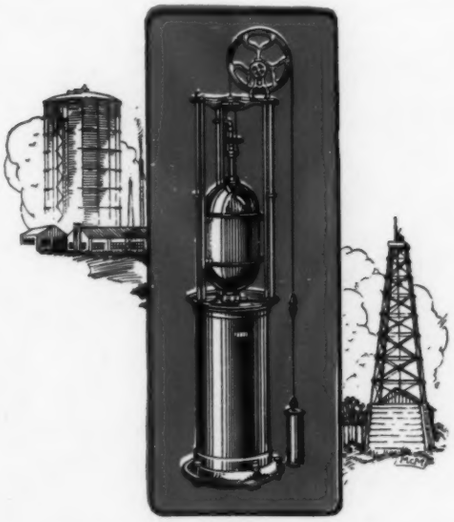
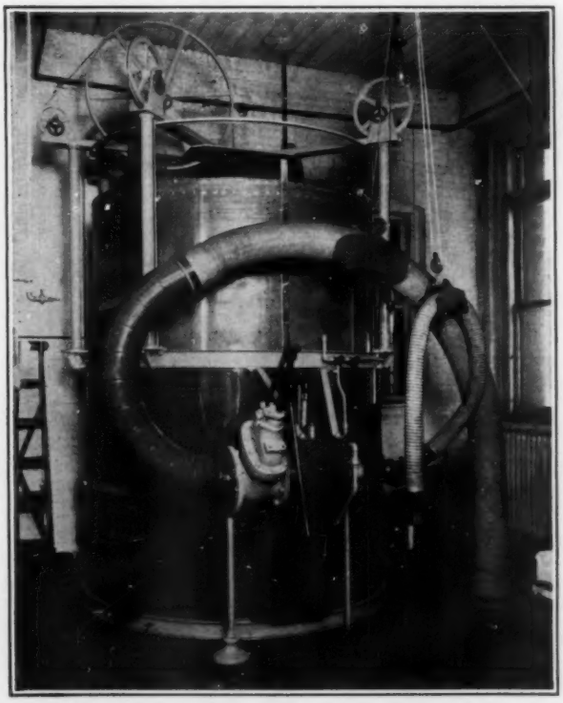


The Cubic Foot Bottle—certified for accuracy by the U. S. Bureau of Standards—symbolizes the enduring standards of measurement maintained by American Meter Company in all manufacturing and laboratory activity.

The Higher Standard

FOR proof of the Correctness of Gas Meter Registration, the vast majority of Gas Company Proving Rooms rely on the "American" Meter Prover.

This instrument has deservedly become the accepted standard for accurate proof:—Unsurpassed quality, craftsmanship and practical experience enter into its manufacture.



A 100-foot Meter Prover constructed by D. McDonald & Co. This prover is particularly adapted to the testing of large capacity meters.

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Meter Testers — Hydro Pneumatic

Wet Test Meters

Specific Gravity Apparatus

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Siphon Gauges

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New Improved Siphon Gauge 4, 6, 8. 10, 12 inch sizes.

Manufactured Gas in Chicago is being distributed by means of Cooper Engines

IN the North Shore Avenue distributing plant of the Peoples Gas Light & Coke Company this Cooper 500 horse power gas engine has for nearly four years been driving a rotary blower, whenever its capacity has been needed. It is used to pump gas from the holder into the distributing mains for the peak demands. A duplicate unit was installed in 1928 in this company's 73rd street plant.

A Cooper gas engine is well fitted for such service. Its installation cost is lower than for a steam plant. It has no standby losses other than interest charges. Its operation is not affected by outside influences as is so frequently true of motor driven compressors when the electric power is interrupted. It is a cheaper source of power than electric power. It uses the same gas for fuel that is being distributed. Let a Cooper engineer explain the many advantages of Cooper gas engines for such service. Cooper engines are built in both horizontal and vertical types in standard sizes from 50 to 1500 B. H. P.

The Cooper-Bessemer Corporation

Mount Vernon, Ohio — Grove City, Pa.

1116 Magnolia Bldg., Dallas — 615 Kennedy Bldg., Tulsa
630 East 61st Street, Los Angeles, Cal.

Production Conference

(*Continued from page 74*)

ment employed there for peak-load gas supply. In that community 850 B.t.u. mixed gas is supplied during cold weather, using natural gas of 1150 B.t.u., low-gravity water-gas of 530 B.t.u. made by the Willien-Stein method, and enrichment with commercial butane, with blow runs on certain sets to give increased gas volume to meet maximum demands. The committee described some of the special equipment which is used for handling this very unusual gas mixture at Louisville.

The third method of gas utilization, as air-butane mixture, has been applied in two Indiana towns, Linton and Sheridan. Re-enrichment of gas after transmission at high pressure has been practiced at Haverhill, Massachusetts, and Newburgh, New York. The sub-committee indicates details of operation in these four plants and points out the advantages and limitations of these new gas-making materials for such situations.

Low-Gravity Water Gas

The sub-committee on low-gravity water gas, under E. H. Hall, of Philadelphia, as chairman, summarized the experiences of several companies in the making of water gas while carbureting with oil on the back run. Mr. O. B. Evans, of the Philadelphia Gas Works, gave the history of the work of his company and summarized his present opinion in the committee report, which opinion has resulted from an elaborate series of operating tests made recently. His conclusion is as follows:

"This series of experiments would appear to show that it is possible to reduce the specific gravity of carburetted water gas from 0.65 to about 0.55, with an increase in capacity and at an increased cost for fuel and oil of approximately 6 cents per million B.t.u., or somewhat under 3 cents per M of 530 B.t.u. gas. With this increase in capacity, there would be a reduction in labor cost and fixed charges so that the net increase might be considerably less than 3 cents per M. As far as our tests have gone, a further reduction in specific gravity below 0.55 will be proportionately more expensive. This process has no effect upon the amount of hydrogen sulphide or organic sulphur in the gas, but apparently does increase the napthalene and does increase the free carbon in the tar to such an extent as to render it unfit for certain uses. While we had no mechanical difficulty from the production of lampblack, it is probable that for continuous operation over long periods, some provision should be made to take care of it."

Mr. L. J. Willien reported tests made by himself and associated engineers of his own or related companies. As a result of experimentation, particularly as Louisville, he summarizes certain points regarding the use of oil on the back run as follows:

"1. The maximum amount of lampblack was carried forward with the gas when using 100 per cent coke as generator fuel. Some of it passed through the relief holder, washer coolers, and up to the P. & A. tar extractor. There was no sign of lampblack in the gas after the P. & A.

"2. The use of a mixture of soft coal and coke as generator fuel materially reduces the lampblack.

"3. The percentage of coal is important. The greater the percentage, the greater the density of the fuel bed and the smaller the amount of oil that can be used on the back run. With 50 per cent coal not more than 30 gallons could be introduced per run; with 30 per cent, 40 gallons; and with 100 per cent coke, 45 gallons could be introduced. As the density of the fuel bed increased, the pressure at the top of the superheater increased when introducing the back run oil. The limiting factor on the pressure was the lifting of the stack cap or valves. A mixture of 30 per cent coal and 70 per cent coke gave the best results.

"4. The production of smoke is a function of the temperature at the top of the superheater. If it is 1300° F. or more, there will be no smoke.

"5. The combined use of a 15-second blow run with oil on the back run and 30 per cent coal produced 50 per cent more gas than the rated capacity of the set, and also produced a gas containing 12 per cent or less of inerts with a gravity of between 0.60 and 0.65, or no greater than the normal operation without a blow run.

"6. The gas made on these tests, when compressed to 100-lb. pressure and delivered 3½ miles through an underground transmission line, lost 16 B.t.u. per cu. ft., or the equivalent of a 3 per cent drop in heating value. Compression also reduced the gravity of the gas about 0.02.

"7. The amount of drip oil squeezed out of the gas on compression to 100-lb. pressure was 25 per cent less when using oil on the back run than with normal operation. Chemical tests made on the drip oil indicated a lower percentage of gum-forming constituents (unsaturated hydrocarbons) than with normal operation."

The committee report also includes a resume of interesting methods for utilizing oil-refinery gas and other high B.t.u. gases for admixture with blue-water gas as an enricher. In this particular the developments somewhat resemble the work described above on the utilization of propane and butane.

Steam Decomposition

Working in conjunction with the sub-committee on steam decomposition in water-gas sets, under the chairmanship of A. E. Lockwood, several investigators have dissected the water-gas process and reported at the conference some of their early conclusions. It is evident from the work done by Huff, of Johns Hopkins, with Logan, of the Baltimore company, and the independent results obtained by R. L. Ellis, of Miami, Florida, that there remain still very important gaps in our knowledge of the behavior of steam in the water-gas machine. These investigators report preliminary results showing a surprising percentage of undecomposed steam under conditions previously thought to be highly favorable. Further results are promised for the near future, and it can be expected that these results will disclose important means for improving water-gas-machine efficiencies.

Natural Gas Men Discuss Important Problems at Kansas City Convention

THE Kansas City Convention ably demonstrated that Natural Gas men are fully cognizant of their various problems and possess the brain power to carry them out to a successful solution. The calibre of the papers and addresses presented, the importance and standing of those in attendance and the generous cooperation on the part of the manufacturers by way of numerous and attractive exhibits stamped the meeting as a success in every respect.

In his address Chairman S. W. Meals called attention to the fact that the industry is fully awake to the necessity for conservation and is mustering its best efforts in this direction.

"Cooperation between the operating companies and the oil producers," with proper and stricter plugging laws on our statute books," said Mr. Meals, "will conserve and save for future generations fuel values inestimable at this time. Storing gas underground will become more popular and a common practice after our engineers have made a more complete study of the problem."

E. J. Stephany, Secretary, Natural Gas Department, reported an increase in membership and stated that there are 91 men on 12 committees of the Natural Gas Department and also 293 natural gas men on 172 general and sectional committees of the A. G. A.

Oscar H. Fogg, President A. G. A. and Alexander Forward, Managing Director,

both had much of interest and value to say to those in attendance.

In the absence of H. C. Abell, Vice-president, Electric Bond and Share Company, his paper was read by Miss Julie Pailet, New Orleans Public Service, Inc. Mr. Abell's paper, "Changing Over A City's Gas Supply," dealt with the experience gotten in changing from Manufactured to Natural Gas in Memphis and New Orleans. Mr. Abell's paper was very comprehensive in scope and should be of value to other communities anticipating such a change-over.

Accurate Measurement

"Some Pipe Line And Transmission Problems," by John C. Diehl, Metric Metal works discussed the various factors affecting the quantity and price of gas.

"In connection with the purchase and sale price of gas," said Mr. Diehl, "the question of how much is bought for a certain sum and the calculation of the total quantity seems to be a subject which should receive more consideration than it has received in a great number of contracts which have been written from time to time. This is especially true in connection with the purchase or sale of gas at locations where the altitude is considerably above sea level. The atmospheric pressure in a great many natural gas localities is from one to three pounds less than the average atmospheric pressure at sea level. In other words, it is not uncommon to have gas measured in locations where the atmospheric pressure is only 12 pounds per square inch absolute."

Harry J. Hoover, in his paper, "What Natural Gas Adds to the Wealth of a State," outlined what Natural Gas has done for the state of Ohio by way of saving the customers money in the event it were assumed that they used some other fuel. This paper had as its basis an intensive research on the use of Natural Gas in Ohio carried out by Mr. Hoover.

"Ohio," said Mr. Hoover, "has more natural gas consumers than has any other state. The United States Bureau of Mines' report for the year 1927 shows Ohio had that year 1,149,760 domestic consumers using 83,654,000,000 cubic feet of natural gas. There was an industrial use of 25,270,000,000 cubic feet, not including the amount of gas used for drilling and other field purposes. Ohio used in 1927 nearly two and a half times as much natural gas as she produced, the excess consumption over her own production being transported from other states."

Selling Appliances

"Selling Domestic Gas," by George Bowersox, Utilization Engineer, So. California Gas Co., Los Angeles, Cal., recommended that gas companies sell appliances and cooperate to the fullest with the dealer. He said:

"If the gas companies do not merchandise appliances it is the forerunner of faulty installations and improper adjustments. Soon gas is looked upon as a fuel which has seen its day of service and everyone who can afford a change will buy electrically operated appliances. And as the load on the electric lines increases, rates will decrease, while the gas rate will increase due to decrease in yearly meter load. But if we continue to introduce and popularize modern gas appliances that meet the requirements of present standards of living we will always enjoy a healthy dividend from the gas company stocks. However, if we wait for dealers to replace obsolete equipment on our lines, it will never be done and further the dealer will follow the trend of profit producing sales. So as the competitive appliances produce the greatest sales volume the dealer will display a full line and eventually may swing over to berating gas appliances and substantiate his contention by his sales records."

H. C. Cooper, Pittsburgh, Pa., went into no little detail in covering the matter of research and H. D. Hancock, of Henry L. Doherty and Co., read a paper on the flow of Natural Gas in pipe lines.

T. R. Weymouth, Oklahoma Natural Gas Corp., Tulsa, Okla., told of the progress made by the committee on the orifice type meter and advised that additional time would have to be devoted to this work in order to round out the matter and report definite findings.

Fuel Competition

"Industrial Sales," by R. M. Redding, Dallas Gas Co., discussed various schedules of rates for a number of Industrial installations in the Southwest and went into the matter of competition with other fuels. In this latter regard Mr. Redding said:

"Cheap fuel oil and coal in powdered form (25,000,000 tons last year) both offer competition which cannot be ignored. This competition is forcing the gas companies to that which they should have done from the beginning, regardless of the keenness of the competition, namely, providing the service of a trained engineer, qualified to select and install burners and combustion chambers for maximum results, and if necessary, able to carry on and assist the customers to design, install and operate to the desired production end of his product, whether this be steam, heat treating of steel, oxidation or reduction, or what not."

"Cracking Natural Gas," by J. A. Yunker, Louisville Gas and Electric Co., dealt with the history of the breaking down of the hydrocarbons of Natural Gas into their elements and went into detail relative to some of this work carried on in Louisville.

"In Louisville," said Mr. Yunker, "we have perfected a method for completely cracking natural gas to hydrogen and carbon at what are economic space velocities. Using standard blue water gas equipment, we have been able to produce a gas containing ninety per cent of hydrogen and less than one per cent of hydrocarbons. We have also been able to recover seven pounds of carbon black, which has been passed on by one of the rubber companies as suitable for the manufacture of tires, per one thousand cubic feet of natural gas processed.

"The experimental work was done in a nine foot water gas set and since several million cubic feet of gas was made and almost a ton of carbon black recovered for testing purposes, we believe we can safely say that the process has passed beyond the experimental stage and is ready for use wherever its results are of value.

Natural Gas in the Generator

"A bed of coke in the generator is blasted in accordance with water gas practice to a temperature in excess of that of the decomposition of methane. The air is then shut off and natural gas turned into the generator in place of steam and the stack valve closed, permitting the gas to pass through cooling coils to the carbon traps and thence into a holder.

"Results obtained in the tests indicate that the capacity of a generator for the production of the cracked gas is approximately its capacity for the production of blue water gas. The amount of the cracked gas that will be produced from a cubic foot of natural, depends, of course, on the composition of the natural gas used and with the 1130 B.t.u. gas used at Louisville, averaged around 2.25 cubic feet. About fifteen pounds of coke was used per one thousand cubic feet of natural gas cracked."

Other papers were read by William Moeller, Jr., who discussed the various methods of pipe protection to prevent corrosion; H. C. Blackwell,—"What the Public Expects of the Gas Industry;" J. J. O'Brien,—"Facts Relating to Natural Gas Service;" E. A. Clark,—"Distribution;" and R. W. Gallagher,—"The Gas Industry—A Giant Servant."

The usual "Question Discussion" was productive of considerable information.

An unusual feature of the Convention was the holding of a Women's Meeting, the first in the history of Natural Gas Conventions.

This meeting which was presided over by Miss Lois Upshaw was productive of a number of good papers and addresses by Keith Clevenger, Mrs. Anna J. Peterson, George H. Finley and Miss Mary Spear.

W. H. Gartley, vice-president The Philadelphia Gas Works Company was one of twelve men, representatives of five countries, who were rewarded by The Franklin Institute for public service and inventive genius, at the annual ceremonies of the Institute on May 15. Ten medals and two certificates were presented at the exercises.

Mr. Gartley was awarded the Walton Clark medal, "in consideration of his engineering contributions to the advancement of the gas industry, to the development of the practical operation of large city gas works, and for his ingenuity, sound judgment and service to the public in his field of work."

16 Fine Gas Works and 17,500,000 Dollars and Ridgway's "Hook 'er to the Biler" Elevator

The Southern Cities Public Service Co. (a subsidiary of the Central Public Service System) has collected the following 16 gas works and is borrowing $17,500,000 with Great Inducements to lend the money. (Splendid Conversion Privilege).

Here are the 16 Gas Works, every one of which has "Hooked 'er to the Biler."

Atlanta, Ga.	Mobile, Ala.	Charleston, S.C.	Pensacola, Fla.
Macon, Ga.	Montgomery, Ala.	Johnson City, Tenn.	Key West, Fla.
Augusta, Ga.	Anniston, Ala.	Meridian, Miss.	W. Palm Beach, Fla.
Roanoke, Va.	Gadsden, Ala.	Hattiesburg, Miss.	Port Arthur, Tex.

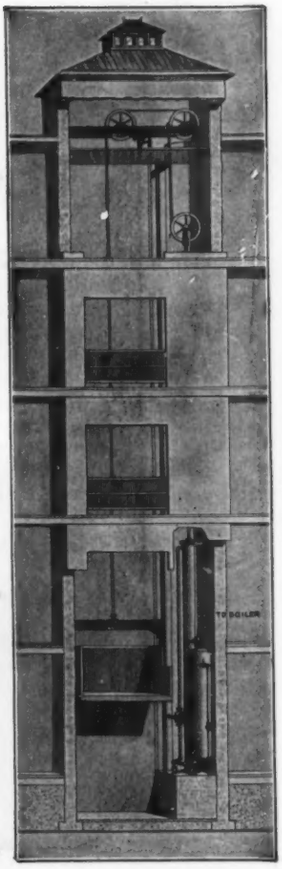
Yes Sir! Every one of these (and hundreds of other Gas Works) use Ridgway Elevators—because it is the one elevator THAT ALWAYS GOES.

The Real Smart One if he has steam (or air) will

"HOOK 'ER TO THE BILER"

Direct Acting

Double Geared



Craig Ridgway & Son Co. Coatesville, Pa.

Elevator Makers to Folks Who Know — Over 3000 in Daily Use

SUPERIOR

Gas Meters

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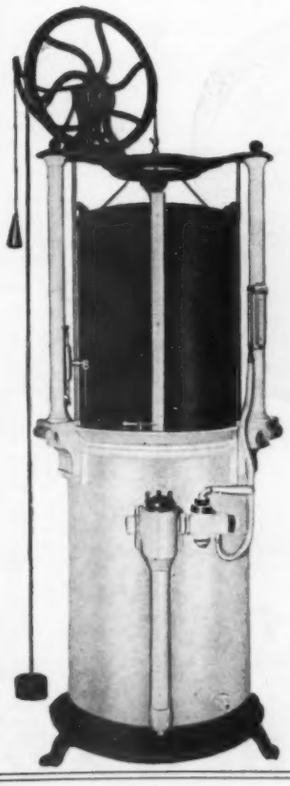

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167-41st Street

Brooklyn, N. Y.

Tycos Gas Leak Indicators

Are a quick and efficient means of locating gas leaks. As soon as the gauges show a leak somewhere along the line, it may be traced by driving small holes along the main and using one of these Indicators. The hand will indicate the place of greatest flow and the leak may be then fixed.

Instruments indicate the presence of either heavy or light gas.

***TYCOS* Gas Leak Indicator No. 3405**

Comes completely equipped in sole leather carrying case with strap, weight about 1¾ pounds.

***TYCOS* Gas Leak Indicator (Vertical form)**

Improved type, vertical form. In sole leather carrying case with strap, weight about 1¾-pounds.

Write for additional information and TYCOS Gas Catalog.

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(Continued on Page 84)

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Warm that Cold Room the Easy Way

With a Welsbach room heater you only pay for the heat you use. The touch of a match brings a cheery comforting glow. The new heaters are finished in crystalline brown and are fitted with burnt brass andirons. They have a special one-piece back and header—an aluminum cast hearth and heavily bronzed steel fire guard. Whatever your need there is a Welsbach model made to suit it. See them at our showroom.

Welsbach ROOM HEATER

DEALER'S NAME HERE

for Warm Rooms on Cold Mornings

The cheery glow of a Welsbach heater makes a warm room a joy on a cold morning. The new Welsbach heaters are economical and efficient. They are fitted with brass andirons and beautifully finished in crystalline brown with cast aluminum hearth and heavily bronzed steel fire guard. A size to suit every room. Now on view at our show rooms.

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Like a Summer Sun on Winter Mornings

DON'T shiver—install a Welsbach Radiant Room Heater and live in comfort.

The new models are the finest examples of modern design and efficiency—each one has the new combination one-piece clay header and back-wall—cast aluminum hearth and heavily bronzed steel fire guard. They are handsomely finished in crystalline brown with burnt brass andirons. There's a Welsbach model made to meet every requirement.

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THE new Welsbach Gas Heaters were designed to meet today's demand for modernity. They are right up to the minute in finish and design. The new burnt brass andirons, heavily bronzed steel fire guards and cast aluminum hearths combined with the handsome crystalline brown finish give them an instant eye-appeal which creates quick and sure sales.

Each heater is built to include the famous Welsbach features such as the "million dollar burner," wire gauze screen burner protector, choke and in addition the new one-piece combination clay back and header.

These new heaters are just the very numbers to liven up your whole room heater department. Backed up by a liberal use of the striking advertisements reproduced in reduced size here, you may be sure they will attract attention to your showroom—and as you know, increased attention means increased sales. Write now for details to

WELSBACH COMPANY
Gloucester City, N. J.
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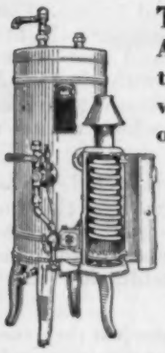
RADIANT GAS HEATERS

Gas... is democratic

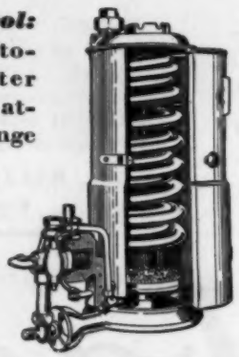
IT serves every class in the community. Consequently you must be prepared to furnish water heaters that meet the requirements of homes and purses of every size. By concentrating your sales effort on the group of automatic water heaters made by The Cleveland Heater Co. you can reach all classes of gas consumers in a way that will prove most satisfactory to them and most profitable to yourself.

The Rival: An automatic water heater of the popular self-contained type. It is fully dependable, strongly built, and moderate in price.



The Rex: An automatic storage water heater of the highest quality, designed for those who want the best. Built with scientific precision of the finest materials, its unfailing efficiency makes it well worth its cost.

The Rex Patrol: A low-priced automatic tank water heater that can be attached to any range boiler.



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This Man can Help You Increase Your Gas Sales

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His job is to help you increase your gas sales by assisting in the merchandising of Hot Water Service. He is ready at any and all times to pull off his coat, roll up his sleeves, and dig into the job. He knows the ins and outs of gas merchandising. His knowledge and experience, backed by the knowledge and experience of the oldest builder of water heaters, is yours for the asking.

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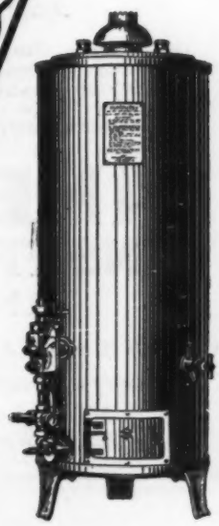

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HUMPHREY COMPANY
Division Ruud Manufacturing Co.
KALAMAZOO, MICHIGAN

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Only the Best Thermometer Pays

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THE KOMPAK CO.

Automatic Thermostatic Gas Water Heaters

NEW BRUNSWICK
NEW JERSEY

BUILDING FOR THE FUTURE

In no other gas appliance is quality such an important factor as in the water heater.

Copper is replacing gutters, down spouts, screening, piping, wherever corrosion exists.

How much more important that the very heart of the water system be made of everlasting Copper.

The Copper Kompak makes lasting friends and life long users, —never needs replacing—and best of all is so economical in operation, that it is used to the maximum extent, benefiting both the Gas Company and the user.

The selling of Copper Kompaks is simply a matter of "EFFORT."

Yours very truly,

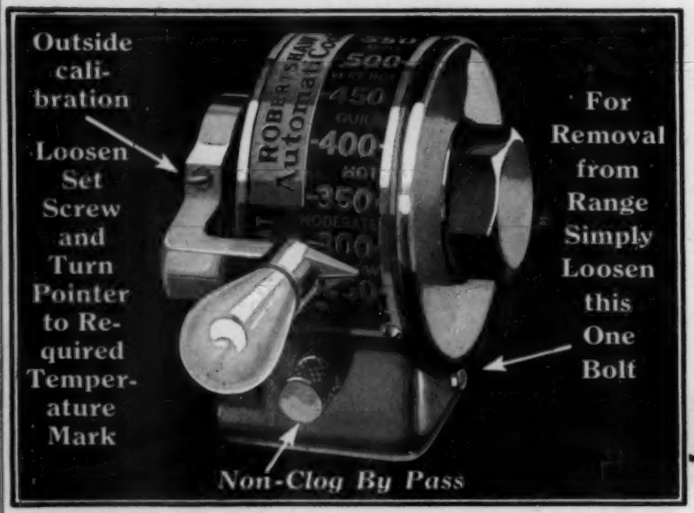
THE KOMPAK COMPANY

H. J. Long,

President

KOMPAK

GAS COMPANIES and STOVE DEALERS



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ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

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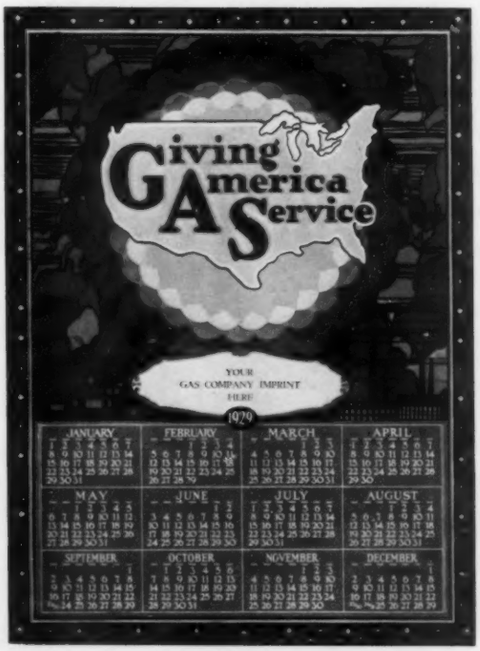
ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

The *First All Gas* Calendar Ever Published!



A truly Beautiful Work of Art that for the first time carries a sales promoting message on each leaf for the full twelve months.

Every Gas Company should place one of these remarkable appliance sales stimulators in the homes of each of their customers—their unusual attractiveness will make them readily acceptable—making it a constant daily load builder.

The upper part carries a National Slogan "Giving America Service"; the capitals of each line stand out prominently, spelling the word GAS, completing the slogan "Gas, Giving America Service." This section is lithographed in nine colors, by the Forbes Lithograph Co., Boston, Mass.

The lower part is printed in white letters and numerals on a deep green ground. The left side contains a picture of some gas appliance adaptable to each month in the year, such as a gas refrigerator for June, as shown here by cut of one of the leaves—this panel is white with the cut and copy in black making a decided contrast, which stamps the appliance illustrated indelibly on the mind of the housewife.

The blank medallion in the center will contain the name of the Gas Company.

The American Gas Journal is publishing this calendar to further the interests of the gas industry, of which for 70 years it has been a part. They are sold in lots from 500 to 50,000 or more, at a price so low that they are within the reach of every gas company in the country.

Send Coupon for Additional Information

AMERICAN GAS JOURNAL
53 Park Place, New York

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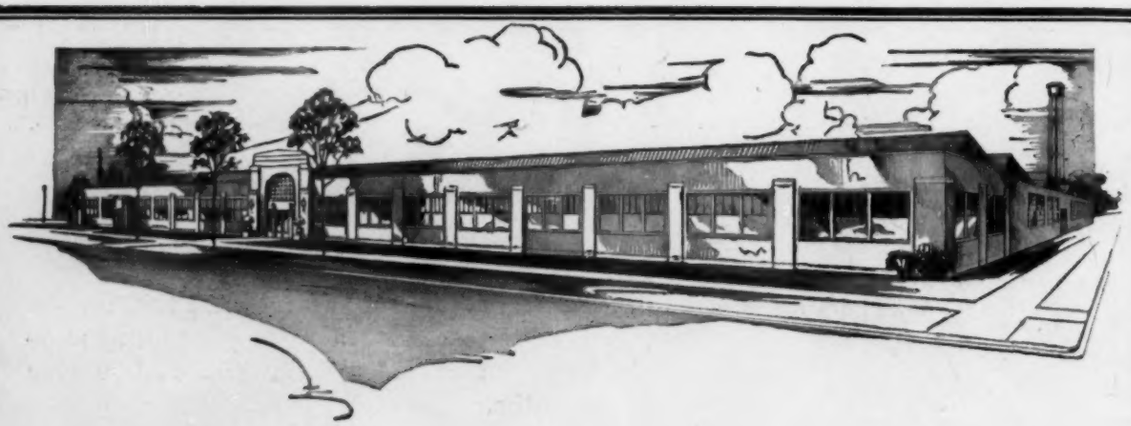

To Serve You Better

NOW Time-O-Stat is occupying its new building, which triples the former floor space and permits physical consolidation of the facilities acquired by merger early this year.

This new structure, with all the economies and efficiency it makes possible, is a tangible step forward in our program as announced when the four companies became one. Every user and prospective user of automatic controls can well take an interest in this development, because it gives us unsurpassed facilities from an engineering and manufacturing standpoint.

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Let us help you with your control problems. Our long experience and the diversity of the fields we serve, make it possible for us to bring a vast fund of information to your assistance.

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Write for our catalogue. Also ask for our booklet containing directions for setting and operating all types of gas regulators. Gas men will find both of value.

The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in All Sizes. From 1 inch to 24 inches; For All Service. 1 Oz. Up to 1,600 Lbs. Pressure to Square Inch.

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EDITOR, AMERICAN GAS JOURNAL, 53 PARK PLACE, NEW YORK

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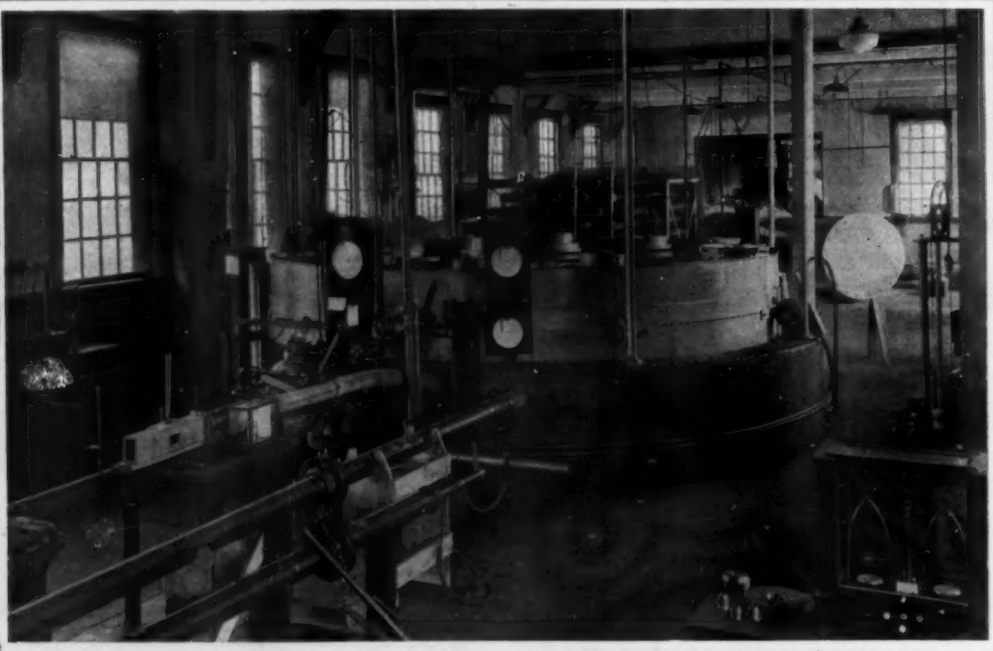

2200-foot prover and other equipment used in the Erie laboratory of American Meter Company

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Values in Gas Measurement

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The World's Largest Manufacturers of Gas Meters and Allied Apparatus

Established 1836

Any activity which may serve the more accurate, practicable or economical Measurement of Gas receives expert attention and full support in the conduct of American Meter Company factories.

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Only thorough test in practice can definitely establish "Known Factors in Meter Value."

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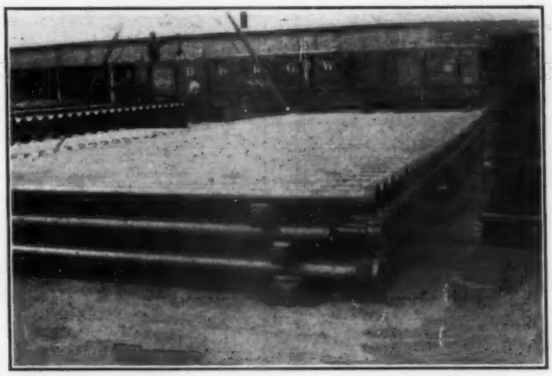
in Cast Iron Pipe

STRAIGHT—	McWane Pipe is straight as an arrow.
STRONG—	McWane Pipe far exceeds A. G. A. requirements.
SOFT—	McWane Pipe cuts, taps, and ships beautifully because it is modern weights yet SAND CAST.
SECTIONS UNIFORM—	McWane method makes uniform wall thicknesses.
SCARCITY OF JOINTS—	McWane 16-foot lengths reduce number of joints per mile.

TYPES
Bell and Spigot
Plain ends
Threaded Bells and Spigots



SIZES
1¼-inch through 12-inches.
Special assembled long lengths in smaller sizes. Investigate.

WRITE FOR ILLUSTRATED LITERATURE

McWANE CAST IRON PIPE CO. BIRMINGHAM, ALA.
PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH
SALES OFFICES IN PRINCIPAL CITIES

McWANE
CAST IRON PIPE

A 10,000,000 cu. ft. capacity waterless gas holder. Priming and finishing coats of CE-CO Gas Holder Paint protect this huge investment

CE-CO Paints Give *Lasting Protection*

There is too much responsibility involved, too much money tied up in gas holders, tanks, piping and other metallic structures comprising gas plant property, to take chances with "any kind" of paint to protect these valuable structures.

To give lasting protection and to feel assured that your property is being *really* protected, you must use paint formulated for the specific purpose intended. Take for example:—

No. 116 Carbon Black

This is an elastic, tough paint composed of the most durable ingredients, made according to our special formula. It is designed for use as a finishing coat over a suitable primer, (such as our No. 250 Sublimed Blue Lead,) on general steel and iron work, including structural steel, coal conveyors, relief holders, purifiers, generators, etc.

For over half a century we have specialized in making technical paints for the protection of metals against corrosive influences, and it has given us a reputation that is authoritative.

Send for descriptive literature and color card 3-A.

Cheesman-Elliot Company, Inc.

Established 1876

TECHNICAL PAINT MAKERS

639-647 Kent Avenue - Brooklyn, N. Y.

Works at Brooklyn, N. Y. and Williamsport, Pa.

HUNT PIVOTED BUCKET CONVEYOR

The peculiar system of driving by pawls, of which the Hunt is the only type existent, relieves the wheel of all stress. The Hunt conveyor can assume twists impossible with a sprocket driven machine.

WE DESIGN AND BUILD:

Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope, and the "Flotograv" (Coke Reclamation System).

C.W.HUNT CO. Inc.

WEST NEW BRIGHTON, STATEN ISLAND, N. Y.

Chicago - Montreal - Boston

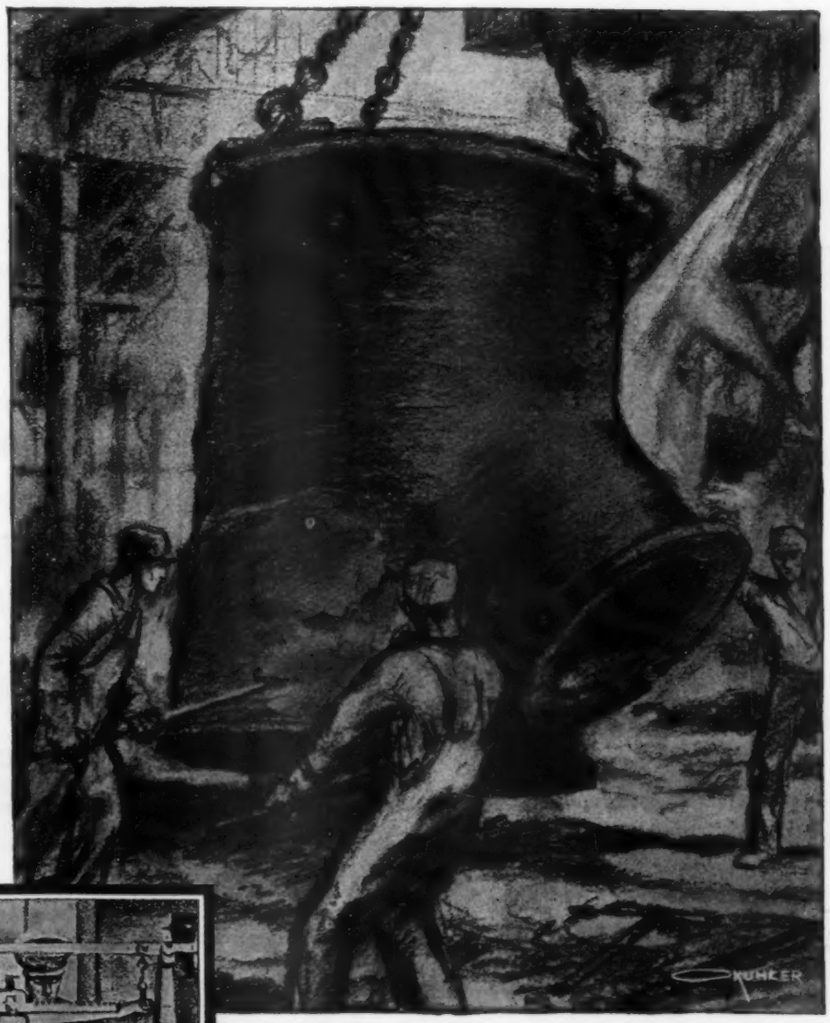
COOLING GAS AFTER COMPRESSION

Reduces drip pumpage. Eliminates leakage from pipe expansion and contraction by stabilizing the temperature of the pipe. We build coolers to reduce gas temperatures to as close as within 5 degrees of the cold water temperature and with small cooling water requirements.

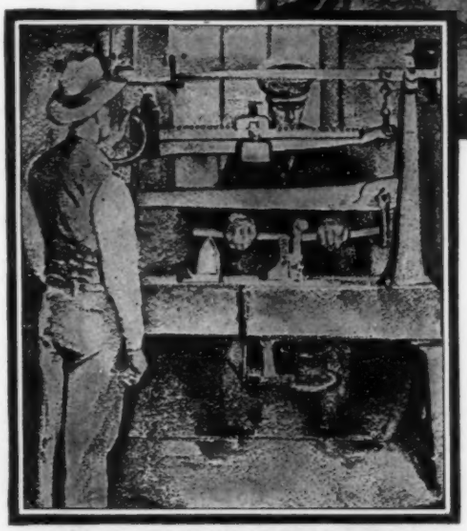
ANDALE COMPANY

1600 ARCH STREET

PHILADELPHIA



In the modern foundry, cast iron specimen bars 26″ x 2″ x 1″ are tested from each run of metal. The bars when placed flatwise upon supports 24 inches apart must sustain a load of 2000 pounds at the center and show a deflection of not less than .30 inches before breaking.



CAST Q IRON

The "Q-check" symbol shown above has been adopted as the trademark of The Cast Iron Pipe Research Association. Insist on this "Q-check" mark when specifying cast iron pipe for gas, water, sewer, or industrial service. For complete information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago.

SCIENCE and invention have been diligently employed in the ancient but alert industry of cast iron pipe manufacture. There are no wasted minutes or motions in the modern cast iron pipe foundry. The work proceeds with the smoothness of practised team-work. Old-time foundry men would doubtless be amazed to observe the many appliances used today to speed the production and assure the uniform quality of modern cast iron pipe.

* * *

The Cast Iron Pipe Research Association is a service organization of leading pipe founders, formed to promote the scientific improvement and proper use of Cast Iron Pipe. Pipe bearing the Association "Q-check" mark may be obtained from the following: American Cast Iron Pipe Co., Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Ave., Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Co., Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Cast Iron Pipe & Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Company, 11 Broadway, New York City.

Copyright 1929, C. I. P. R. Ass'n.

CAST IRON PIPE

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

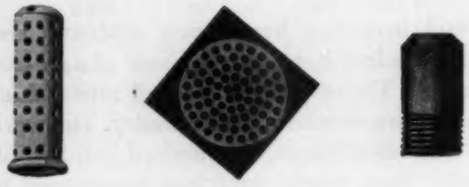
are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY
1439 BRANDYWINE STREET - - - - - PHILADELPHIA, PA.

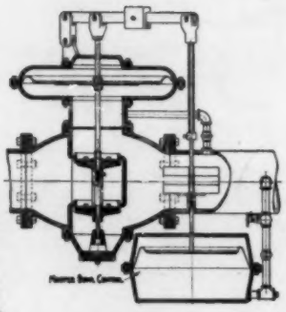
Gas Outlets



Uniformity of the gas flame is maintained when Lava is the material employed for gas outlets. Lava parts, that we have manufactured have been varied as to size and design to meet the demands of the gas industry. We invite correspondence.

American Lava Corporation
29-59 William St. Chattanooga, Tenn.
Manufacturers of Lava Tips & Heat Resistant Insulators

GROBLE REGULATORS & GOVERNORS

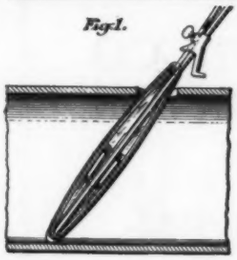


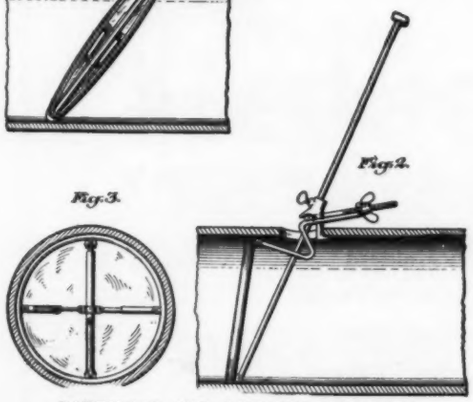
Master Bowl Control insures sensitive regulation and positive lock-off.

GROBLE GAS REGULATOR COMPANY
Anderson, Indiana

Representatives

H. E. Broughton, 404 Donovan Building, Detroit.
The Worrall Co., 472 Central Ave., East Orange, N. J.
Midland Supply Co., Dwight Bldg., Kansas City, Mo.
Seidenglans & Co., Second Unit Santa Fe Bldg., Dallas.





PATENTED AND PATENTS PENDING

THE GOODMAN STOPPER

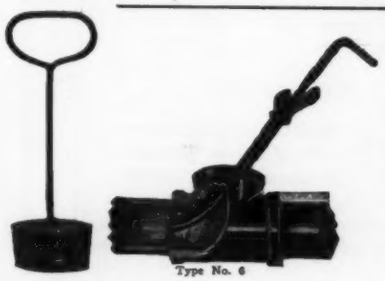
Used since 1897

With improvements added from time to time, now has as its newest feature the "Z" Handle and cross-bar backing up the diaphragm.

The Locking Sleeve (shown in detail at right) holds the Stopper firmly in place.

LOOK FOR THE NAME

"GOODMAN"



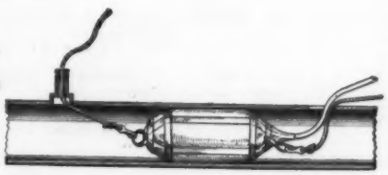
PLUGS

Many types for many uses.

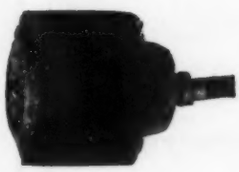
PIPE LINE SUPPLIES

GOODMAN CYLINDRICAL STOPPER

Inflatable for intermediate pressures



DEPENDABLE GAS MAIN BAGS



PIPE CLEANING BRUSHES

TYPE-A Seamless Rubber

TYPE-B Reinforced Seams

AIR - LINE MASK

Mask and blower in separate carrying cases.

TYPE-C

Canvas covered, treated to resist action of oil. Used in oil lines while welding.

Cut shows Gas Bag Valve and Gauge Combination in use

Have you seen the SPRING HEEL PLUG.

SAFETY GAS MAIN STOPPER CO.

523 Atlantic Avenue BROOKLYN, NEW YORK

CABLE ADDRESS GASTOPPER, N. Y.

NEW ENGLAND REP. EASTERN SERVICE COMPANY, BOSTON, MASS

PACIFIC COAST REPRESENTATIVE C. B. BABCOCK CO., SAN FRANCISCO, CAL.

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY
TROY, N. Y.

New York 81 Fulton St. | Boston Tremont Bldg. | Philadelphia Harrison Building
Chicago The Rookery | Pittsburgh Oliver Bldg. | Kansas City R. A. Long Bldg.

RITER-CONLEY CO.
STEEL CONSTRUCTION
PITTSBURGH

STEEL PLATEWORK
FOR
THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
Purifiers

BRANCH OFFICES
New York — Boston — Baltimore
Chicago — Philadelphia — Detroit
Cleveland — Cincinnati — Seattle
San Francisco — Los Angeles

LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

LAMBERT METER CO.
BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

Byllesby Engineering and Management Corporation

BYLLESBY
PIONEERS IN PUBLIC SERVICE
ENGINEERING FINANCE MANAGEMENT

CHICAGO NEW YORK
Pittsburgh San Francisco

Four men carrying a 40 foot length of 10" Naylor Pipe

Reduce

Handling Costs!
Maintenance Costs!

Naylor Pipe Will Help You To Do Both

NAYLOR Pipe begins to save money right at the railroad siding.

How? In handling—because of its light weight.

Naylor Pipe, size for size, weighs one half that of standard weight wrought pipe, yet its structure is such that it will carry the same pressures. This means that every time it is picked up—loaded, transported, unloaded and erected—it costs you less. You save money.

Also, Naylor Pipe is made of Toncan Iron (an alloy of Iron, Copper and Molybdenum) which gives it a far greater resistance to rust and corrosion. This results in longer life of the pipe. Fewer renewals mean lower maintenance.

Thus, Naylor Pipe provides lower handling costs and lower maintenance costs—an economical combination that should not be overlooked in pipe line service. Send for a sample length of Naylor Pipe.

Naylor Pipe Company

Main Office and Plant, 1230 East 92nd Street, Chicago

Sales Offices:

New York, 25 Church Street
Philadelphia, Witherspoon Building
Tulsa, 507 Philtower Building
Detroit—1500 Cadillac Square Building

Ducommun Corporation

Los Angeles
San Francisco

Exclusive Distributors: California, Arizona, Nevada and Utah
Montreal, Canada—Mechanical Equipment Company, New Birks Building

TONCAN

Naylor Pipe

Mo-lyb-den-um

IRON

Where corrosion resistance is not a factor Naylor Pipe can be furnished in steel.

Standardized Naylor Pipe is made in sizes 6" to 12" in standard 20 ft. lengths or special lengths up to 40 ft. Made with 5 types of pipe ends to wrought pipe standards for 5 types of joints.

Toncan Copper Molybdenum Iron is a development of Central Alloy Steel Corporation, the world's largest and most highly specialized alloy steel producers. It possesses a superior corrosion resistance, making it the favored pipe material

Buyers' Reference Index

See page 121 for advertisements of these products

A. B. C. SELF CLINKERING GRATES
The Western Gas Construction Company.

ACCUMULATORS—STEAM
The Gas Machinery Co.
Ruth's Steam Accumulator Co.
A. O. Smith Corp.
Smoot Engineering Corp.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

ACETYLENE
The Prest-O-Lite Co., Inc.
Oxweld Acetylene Co.

ACETYLENE EQUIPMENT
American Lava Corp.

ACCOUNTING MACHINES
Remington Rand, Inc.

AMMONIA CONCENTRATORS
Bartlett Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA CONCENTRATED LIQUOR PLANTS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

AMMONIA PIPE
National Tube Company.

AMMONIA RECOVERY APPARATUS
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA TEST
American Meter Co.

APPRAISALS & INVENTORIES
Stacey Bros. Gas Construction Co.
United Engineers & Constructors, Inc.

APPARATUS
Laboratory Experimental
American Meter Co.
Service
American Meter Co.

ASH STORAGE BINS
C. W. Hunt Co., Inc.
Semet-Solvay Engineering Corp.
Riter-Conley Co.
The Stacey Mfg. Co.

AUDITS
United Engineers & Constructors, Inc.

AUTOMATIC CONTROLS FOR WATER GAS APP.
The Brown Instrument Co.
United Engineers & Constructors, Inc.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BACK PRESSURE VALVES
Connelly Iron Sponge & Governor Co.

BACKRUN GAS EQUIPMENT
Semet-Solvay Engineering Corp.

BAGS
Safety Gas Main Stopper Co.

BAROMETERS
Connelly Iron Sponge & Governor Co.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies

BENCHES
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Gas Machinery Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BENZOL
Bartlett-Hayward Co.
Indugas, Inc.
The Koppers Construction Co.

BENZOL RECOVERY PLANTS
Semet-Solvay Engineering Corp.

BLOWERS
Connersville Blower Co., The.
Gas Engineering Co.
The Gas Machinery Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BLUE GAS PLANT
Bartlett-Hayward Co.
Indugas, Inc.
Gas Engineering Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BOILERS (GAS FIRED)
P. M Lattner Mfg. Co.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Combustion Engineering Corpn.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

BOOKKEEPING MACHINES
Remington Rand, Inc.

BOOSTERS
Connelly Iron Sponge & Governor Co.
Connersville Blower Co., The

BRICK
Fire and Checker
Botfield Refractories Co.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment Co.-Russell Eng. Corp.
United Engineers & Constructors, Inc.
United States Refractories Corp.
Silica
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Company.
United States Refractories Corp.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
Alpha-Lux Co.

BUILDINGS
United Engineers & Constructors, Inc.

BURNERS (Industrial)
American Lava Corp.
The C. M. Kemp Mfg. Co.
Conversion
Cleveland Gas Burner & Appliance Co.
Conversion House Heating
Roberts Gas Burner Corp.
Fuel
Cleveland Gas Burner & Appliance Co.

BY-PRODUCT COKE
Semet-Solvay Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Indugas, Inc.
The Gas Machinery Co.
International Coal Carbonization Co.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
West Gas Improvement Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.
Alpha-Lux Company.
American Meter Co.
Consolidated Ashcroft Hancock Inc., Co.

CALORIMETERS
John J. Griffin & Company.

CALORIMETER ACCESSORIES
American Meter Co.

CARBIDE
Union Carbide Sales Co.

CARBONIZATION
The Gas Machinery Co.
Low Temperature
International Coal Carbonization Co.

CARBURETTED WATER GAS
The Western Gas Construction Co.

CARBURETTED WATER GAS PLANTS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

CARS
C. W. Hunt Co., Inc.

CASINGS, SEAMLESS STEEL
National Tube Co.

CAST IRON PIPE
Bell
Cast Iron Pipe Research Ass'n.
Spigot
Cast Iron Pipe Research Ass'n.

CEMENTS
Acid-proof
Botfield Refractories Company.
General Refractories Co.
Quigley Furnace Spec. Co., Inc.
Firebrick
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United States Refractories Corp.
High Temperature
Alpha-Lux Company.
Botfield Refractories Company.
General Refractories Co.
E. J. Lavino & Co.
Quigley Furnace Spec. Co., Inc.
United States Refractories Corp.
Refractory
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Co.
Refractory Engineering Corp.
United States Refractories Corp.

CHAMBER OVENS
United Engineers & Constructors, Inc.

CHARGING MACHINERY
Bartlett-Hayward Co.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

CHUTES
C. W. Hunt Co., Inc.
Riter-Conley Company.
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

CLAMPS (PIPE)
S. R. Dresser Mfg. Co.

CLOCKS & WATCHES, Stop
American Meter Co.

COALS
Boone County Coal Corpn.
Logan County Coal Corp.
Westmoreland Coal Co

COAL GAS APPARATUS
Bartlett-Hayward Co.
Indugas, Inc.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Company.
The Western Gas Construction Company.

COAL & COKE BINS CASTINGS
The Koppers Construction Co.
The Stacey Mfg. Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Dry Quenching Equipment Corp.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.

COAL TAR PRODUCTS
International Combustion, Tar, and Chemical Corpn.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COAL TUBES
C. W. Hunt Co., Inc.
Meter
American Meter Co.
Superior Meter Co.
Service
American Meter Co

COKE CRUSHERS
The Koppers Construction Co.

COKE QUENCHING
Dry Quenching Equipment Corp.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COKE RECLAMATION SYSTEMS
C. W. Hunt Co., Inc.

COMPUTERS
Heating Value
United Engineers & Constructors, Inc.

CONDENSERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.
High Duty
Stacey Bros. Gas Const. Co.
United Engineers & Constructors Inc.

CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

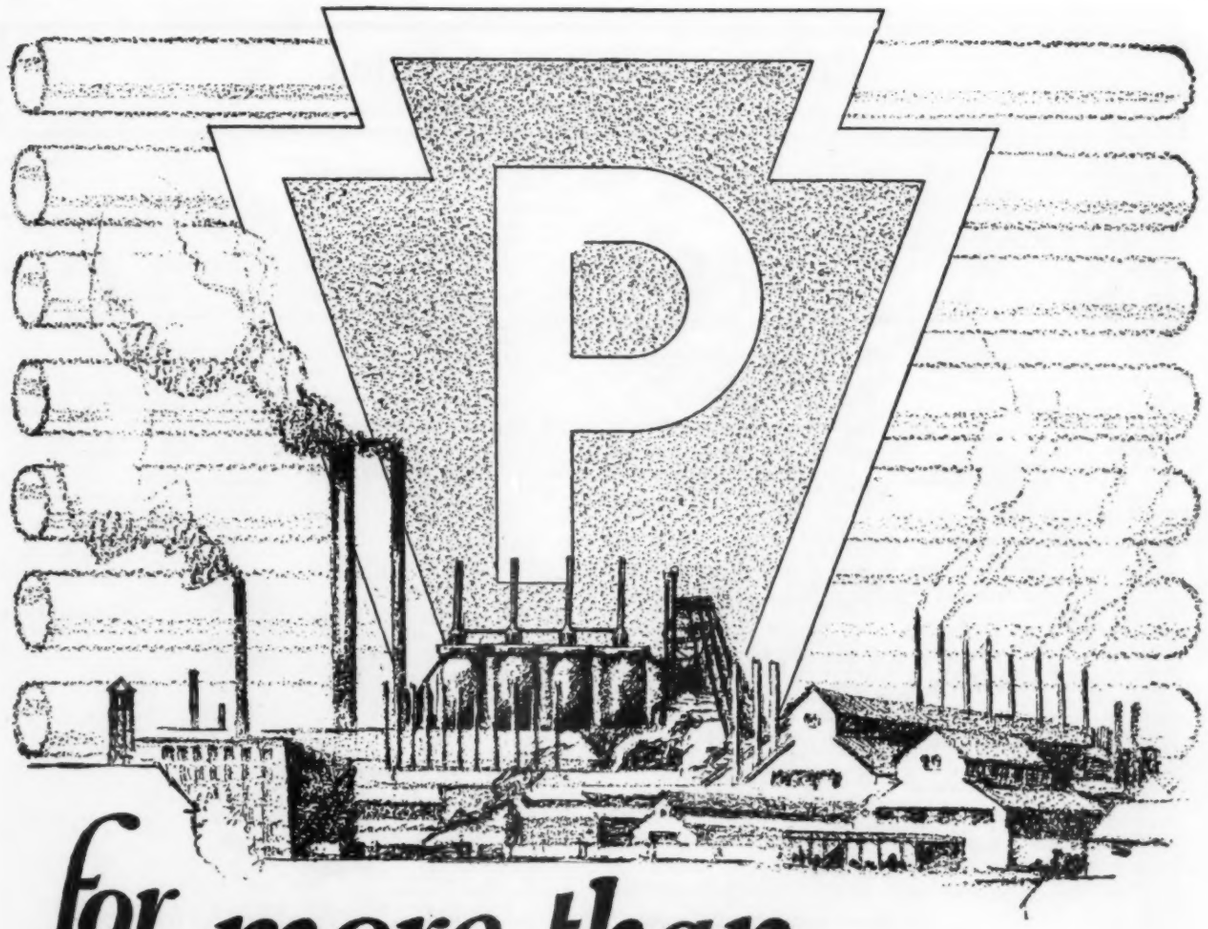
CONTROLS
The Bristol Company.
The Brown Instrument Co.
Robertshaw Thermostat Co.
Time-O-Stat Controls Co.
Combustion
Smoot Engineering Corp.
Gas Pressure
Smoot Engineering Corp.
Gas Producer
Smoot Engineering Corp.
Hot Water Heat System
The Cleveland Heater Company.
Water Gas Machine
Smoot Engineering Corp.

CONVEYORS
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.

CONCENTRATORS, AMMONIA
(See Ammonia Concentrators.)

COOLERS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.
Air
Andale Company.
Ammonia Liquor
Andale Company.
Gas
Andale Company.
Oil
Andale Company.

COOLING COILS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.



for more than 25 YEARS..

Perfection and Pittsburgh Seamless have stood for One and the Same Thing . . . .

More than a quarter century devoted to the development and exclusive manufacture of seamless steel pipe and tubing—control of facilities covering every step in the manufacturing process, from raw material to finished product—a never tiring effort to produce a better and still better Pittsburgh Seamless—these are the factors which have enabled this, the oldest and largest concern manufacturing "seamless" exclusively, to produce seamless steel tubular products of outstanding superiority.

From Ore to Finished Pipe or Tube —Pittsburgh Seamless is the product of one Company's Resources and Skill . . . .

Pittsburgh Steel Products Co.

DIVISION OF
Pittsburgh Steel Co.

Pittsburgh New York Houston Chicago St. Louis Detroit Tulsa

Pittsburgh Seamless

Largest Manufacturers of Seamless Steel Pipe and Tubing Exclusively

2901

Buyers' Reference Index

See page 121 for advertisements of these products

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
National Tube Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Victaulic Co. of Amer.

COUPLINGS—FLEXIBLE
The P. H. & F. M. Roots Company.

CUTTING APPARATUS & SUPPLIES
Union Carbide & Carbon Co.

CRUSHERS
Riter-Conley Company.

CUBIC FOOT BOTTLES
American Meter Co.
Lambert Meter Co.

DE-EMULSIFIERS
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

DEHYDRATORS, GAS
Andale Company.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.
The Western Gas Construction Company.

DEMONSTRATION METERS
Lambert Meter Co.

DIAPHRAGMS
Lambert Meter Co.
(Meter)
American Meter Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.

DRAFT GAUGES
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

DRYERS (Laundry)
W. E. Lamneck Co.

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
C. W. Hunt Co., Inc.
Craig Ridgway & Son Co.
Robins Conveying Belt Co.

ENGINE INDICATORS
Consolidated Ashcroft Hancock Co., Inc.

ENGINEERS
American Meter Co.
The Gas Machinery Co.
Combustion
Bartlett-Hayward Co.
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.
United Engineers & Constructors, Inc.
Consulting
Bartlett-Hayward Co.
Edw. A. Dieterle
United Engineers & Constructors, Inc.
George H. Waring.
The Western Gas Construction Company.
Contracting
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Company.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
Riter-Conley Company.
Stacey Gros. Gas Const. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.
Distribution
United Engineers & Constructors, Inc.
Measurement
American Meter Co.

EXHAUSTERS
Connersville Blower Co., The
The Gas Machinery Co.
Isbell-Porter Company.
The P. H. & F. M. Roots Company.
The Western Gas Construction Company.

EXPANSION BENDS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

FILES (Steel and Wood)
Remington Rand, Inc.

FILES (Visible)
Remington Rand, Inc.

FILTERS, Gas
American Meter Co.

FIREBRICK, CEMENT
General Refractories Co.
Quigley Furnace Specialties Co., Inc.

FIREBRICK CHECKER BRICK
(See Brick)
Botfield Refractories Company.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FIRST AID EQUIPMENT
United Engineers & Constructors, Inc.

FITTINGS
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe and Foundry Co.
The Western Gas Construction Company.
Plain End and Flanged
Cast Iron Pipe Research Association.

FIXTURES
American Lava Corp.

FLOORS, IRON, BRICK, AND STEEL
The Gas Machinery Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FLOW METERS
Brown Instrument Co., The
Lambert Meter Co.

FLUE PIPE (Cast Iron Oval)
James B. Clow & Sons.
Semet-Solvay Engineering Corp.

FURNACES
Combustion Engineering Corpn.
James B. Clow & Sons.
Gas Fired
The C. M. Kemp Mfg. Co.
Gas Soldering
American Meter Co.

GAS ANALYSIS APPARATUS
Metric Metal Works.

GASKETS
American Meter Co.
Consolidated Ashcroft Hancock Co., Inc.
Pittsburgh Equitable Meter Co.

GAS COAL
Boone County Coal Corpn.
Pittsburgh Coal Co.
Westmoreland Coal Co.

GASOMETERS (Test)
American Meter Co.

GAS PLANTS, COMPLETE
Indugas, Inc.
Gas Engineering Co.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.

GASSING MACHINE
American Meter Co.
Lambert Meter Co.

GAS TAPE
Connelly Iron Sponge & Governor Co.

GAS TESTING APPARATUS
Metric Metal Works.

GATE VALVES (See Valves)

GATES—WIND & BLAST
The P. H. & F. M. Roots Company.

GAUGE BOARDS
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

GAUGES
American Meter Co.
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
Maryland Meter Co.
Metric Metal Works.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Taylor Instrument Companies.
Tagliabue Mfg. Co., C. J.
The Western Gas Construction Company.
Mercury
Precision Thermometer & Instrument Company.
Pressure-Recording
Consolidated Ashcroft Hancock Co., Inc.
D. McDonald & Co.
Precision Thermometer & Instrument Company.
Tagliabue Mfg. Co., C. J.
Siphon
Precision Thermometer & Instrument Company.
Tank
Precision Thermometer & Instrument Company.
Water
Precision Thermometer & Instrument Company.

GLOVES
Rubber
Safety Gas Main Stopper Co.

GOVERNORS
Pittsburgh Equitable Meter Co.
Automatic
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.

GOVERNORS (Calorimeter and Double Dry)
American Meter Co.
Coke Oven
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
District
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Helme & McIlhenny.
Isbell-Porter Co.
Smoot Engineering Corp.
Exhauster
Connelly Iron Sponge & Governor Co.
Connersville Blower Co., The
The Gas Machinery Co.
Isbell-Porter Co.
The P. H. & F. M. Roots Company.
Smoot Engineering Corp.
High Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
American Meter Co.
Connelly Iron Sponge & Governor Co.
Lambert Meter Co.
D. McDonald & Co.
Reynolds Gas Regulator Co.
Low Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Lambert Meter Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Isbell-Porter Company.
Station
Helme & McIlhenny.

GRATES for Water Gas Generators
Semet-Solvay Engineering Corp.

GRAVITOMETERS
Precision Thermometer & Instrument Company.

GRIDS, for Scrubbers
Semet-Solvay Engineering Corp.

HEATERS
Feed Water
Andale Company.
House
American Gas Products Corp.
Cleveland Gas Burner & Appliance Co.
The Cleveland Heater Company.
American Stove Company.
Homestead Heater Company.
Welsbach Company.
The Cleveland Heater Company.
Humphrey Company.
Kompak Company.
Welsbach Company.
Pittsburg Water Heater Co.

HIGH CAPACITY METERS
Lambert Meter Co.

HIGH PRESSURE PIPE LINES
The Western Gas Construction Company.

HOISTS
The Gas Machinery Co.
C. W. Hunt Co., Inc.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Company.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.

HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
Riter-Conley Company.
The Stacey Mfg. Co.

HOTELS
Shelburne Hotel.

HOWARD AUTOMATIC CHARGERS
The Western Gas Construction Company.

HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

HYDROGEN SULPHITE TEST (Apparatus)
American Meter Co.

HYDROMETERS
The Brown Instrument Co.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

INCINERATORS, GAS-FIRED
Home Incinerator Co.
Kernit Incinerator Co.

INDUSTRIAL GAS MIXERS
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Corp.
Smoot Engineering Corp.

INDUSTRIAL TRACK
C. W. Hunt Co., Inc.

IRON BORING OXIDE
Gas Purifying Materials Co., Inc.

IRON SPONGE
Connelly Iron Sponge & Governor Co.

INSTRUMENTS
Alpha-Lux Company.
The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Lambert Meter Co.
Metric Metal Works.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.
Time-O-Stat Controls Co.

"Cutting the Mile in two" with double length pipe!

In the laying of this 18 mile line of 12-inch double random length "NATIONAL" Pipe there was a considerable saving, due to eliminating approximately one-half the number of joints. In addition to the saving in time, labor and joint-making materials, the possibility of leakage is also reduced and an all around better line is the result.

"NATIONAL" is the only pipe made in double random lengths and, aside from this feature, it is especially desirable for gas lines because of its high tensile strength, uniform structure, good welding qualities and resistance to corrosion—assuring a strong, sound, dependable line from end to end. Ask for Bulletin No. 26.

NATIONAL TUBE COMPANY • Pittsburgh, Pa.

Subsidiary of United States Steel Corporation

"NATIONAL"

Buyers' Reference Index

See page 121 for advertisements of these products

Recording
American Meter Co.

JOINTS (Pipe)
S. R. Dresser Mfg. Co.
Southwestern Pipe Joint & Engr. Co.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
United Engineers & Constructors, Inc.
Victaulic Co. of Amer.

JOINT RUNNERS
Safety Gas Main Stopper Co.

LAMP POSTS
General Gas Light Co.

LAUNDRY EQUIPMENT
W. E. Lamnock Co.

LAVA BURNER GRIDS
American Lava Corp.

LAVA PILOT TIPS
American Lava Corp.

LINING—REFRACTORY
(See Refractory Linings

LOCKERS
Remington Rand Co.

LOOSE LEAF EQUIPMENT
Remington Rand Co.

LUX MATERIAL
Alpha-Lux Company.

LUX SPONGE
Alpha-Lux Company.

MANILA AND WIRE ROPE
C. W. Hunt Co., Inc.

MANOMETERS
Brown Instrument Co., The
Precision Thermometer & Instrument Company.

MANTLES
General Gas Light Co.
Welsbach Company.

MASKS—GAS
Safety Gas Main Stopper Co.

MAST & GAFF OUTFITS
C. W. Hunt Co., Inc.

MEASURING CHUTES
C. W. Hunt Co., Inc.

MECHANICAL GENERATORS for Water Gas App.
United Engineers & Constructors, Inc.

METER CONNECTIONS
American Meter Co.
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
Lambert Meter Co.
D. McDonald & Co.
Maryland Meter Works.
Pittsburgh Equitable Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.

METER REPAIRING
Lambert Meter Co.

METER TESTER, Hydro-Pneumatic
American Meter Co.

METERS
Brown Instrument Co., The
Pittsburgh Equitable Meter Co.
Air
American Meter Co.
Connersville Blower Co., The
The Gas Machinery Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.
Artificial
American Meter Co.
Connersville Blower Co., The
Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company
The Sprague Meter Co.
Nathaniel Tufts Meter Works.
Demand
American Meter Co.
Connersville Blower Co., The
John J. Griffin & Company.
Lambert Meter Co.
D. McDonald & Co.
The P. H. & F. M. Roots Company.
Superior Meter Co.
Demonstration
American Meter Co.
Dry
American Meter Co.
John J. Griffin & Company.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
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American Meter Co.
Natural Gas
American Meter Co.
Connersville Blower Co., The
John J. Griffin & Company.
Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Meter Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Oil
American Meter Co.
Connersville Blower Co., The
The Gas Machinery Co.
Orifice
American Meter Co.
Positive
The Sprague Meter Co.
Prepayment
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Proportional
The P. H. & F. M. Roots Company.
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American Meter Co.
Connersville Blower Co., The
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
Nathaniel Tufts Meter Works.
The Western Gas Construction Company.
Steam
American Meter Co.
The Gas Machinery Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company
Test
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Wet Test
American Meter Co.

MILLER GRIP PACKING
Connelly Iron Sponge & Governor Co.

MIXERS, GAS
Roberts Gas Burner Corp.
Semet-Solvay Engineering Corp.
Smoot Engineering Corp.

MOISTURE DETERMINATORS
United Engineers & Constructors, Inc.

MOTOR CARS
C. W. Hunt Co .,Inc.

NAPHTHALENE EXTRACTORS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

OFFICE FURNITURE
Remington Rand, Inc.

ORE, CHROME
E. J. Lavino & Co.

OVENS (REEL TYPE BAKE)
The Bruce McDonald Co.

OVENS—COKE AND GAS
Indugas, Inc.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

OXIDE
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co., Inc.
E. J. Lavino & Co.

OXYGEN
Linde Air Products Co.

OXYGEN AND HYDROGEN METERS
Lambert Meter Co.

PACKING
Asbestos
Safety Gas Main Stopper Co.

PAINTS
Cheesman-Elliott Co.
Safety Gas Main Stopper Co.
The Stacey Mfg. Co.
Wailes Dove-Hermiston Corp.
Metal Protective
Semet-Solvay Co.

PAINTS, ANTI ACID AND ALKALI
Cheesman-Elliott Co.
Quigley Furnace Spec. Co., Inc.

PAINTS, RUSTPROOF
Cheesman-Elliott Co.
Quigley Furnace Spec. Co., Inc.

PHOTOMETERS
Connelly Iron Sponge & Governor Co.

PIOTS-SAFETY
Time-O-Stat Controls Co.

PIPE
Waylow Pipe Co.
Hedges-Walsh-Weidner Co.
National Tube Co.
The Stacey Mfg. Co.
Bell
American Meter Co.
Semet-Solvay Engineering Corp.
McWane Cast Iron Pipe Co.
Bell and Spigot
U. S. Cast Iron Pipe & Foundry Co.
Cast Iron
McWane Cast Iron Pipe Co.
U. S. Cast Iron Pipe & Foundry Co.
Flange
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Screw Joint Cast Iron Pipe
McWane Cast Iron Pipe Co.
Seamless Steel
Pittsburgh Steel Products Co.
Spigot
McWane Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Naylor Spiral Pipe Co.
Steel
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Pittsburgh Steel Products Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Spiral Pipe
Naylor Spiral
Welded Steel
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.

PIPE COATINGS
Wailes-Dove-Hermiston Corp.

PLANTS—GAS, COMPLETE
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
The Koppers Construction Co.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

West Gas Improvement Co.
The Western Gas Construction Company.

PLATES
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
The Stacey Mfg. Co.
The Western Gas Construction Company.
Floor
Gas Engineering Co.
The Gas Machinery Co.
Riter-Conley Company.
United Engineers & Constructors, Inc.

PLUGS, SERVICE AND MAIN
Rubber
Safety Gas Main Stopper Co.
Soft Wood
Safety Gas Main Stopper Co.

PORTABLE TEST METERS
Lambert Meter Co.

PRODUCER GAS PLANT
Gas Engineering Co.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

PRODUCER GAS STEAM
American Meter Co.

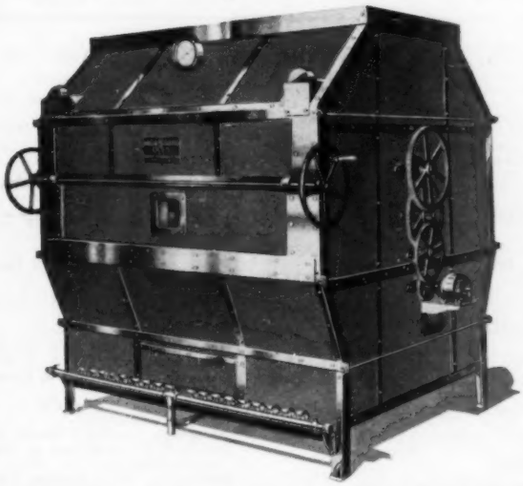
PROVERS—Critical Flow for H. P Field Testing
American Meter Co.

PROVERS—METER
John J. Griffin & Company.
Helme & McIlhenny.
Lambert Meter Co.
D. McDonald & Co.
Pittsburgh Equitable Meter Co.
Superior Meter Co.

PUMPS
Drip
American Meter Co.
The Gas Machinery Co.
Lambert Meter Co.
D. McDonald & Co.
Gas
The P. H. & F. M. Roots Company.
Gas Bag
Safety Gas Main Stopper Co.
Hand
Lambert Meter Co.
Oil
Connersville Blower Co., The
The Gas Machinery Co.
D. McDonald & Co.
The P. H. & F. M. Roots Company.
Power
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Pressure
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Service
American Meter Co.
Lambert Meter Co.
Superior Meter Co.
Service Cleaner
American Meter Co.
John J. Griffin & Company.
Lambert Meter Co.
Safety Gas Main Stopper Co.
Superior Meter Co.
Tar
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Water
Connersville Blower Co., The
The P. H. & F. M. Roots Company.
Vacuum
American Meter Co.
Connersville Blower Co., The
The P. H. & F. M. Roots Company.

PURIFIERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co
Semet-Solvay Engineering Corp
Stacey Bros. Gas. Const. Co.
The Stacey Mfg. Co.
Riter-Conley Company.
United Engineers & Constructors Inc.
The Western Gas Construction Company.

The All-Purpose Gas Oven



For all baking operations, THE MEEK REEL OVEN, embodying the perfected principle of "motion in baking" is without a peer. Write us, telling us your problem. Our experience with thousands of oven users will be at your disposal. Ask for catalog.

The Bruce McDonald Co.,
2015 Washington St.,
KANSAS CITY, MO.

HYTEMPITE

(Reg. U. S. Pat. Off.)

"The Universal High Temperature Cement"

For Gas Plants

—insures quick, economical repairs of Retorts, Jamb Joints, Furnace Walls, Arches and Baffles

—can be used with salvaged, crushed old fire brick

—is not affected by heating and cooling of ovens.

—stands up under severe weather conditions.

—makes thin, strong joint between tile or brick that stands up under extreme abrasive action of clinker tools.

—is easily shot into place with Quigley Refractory Gun.

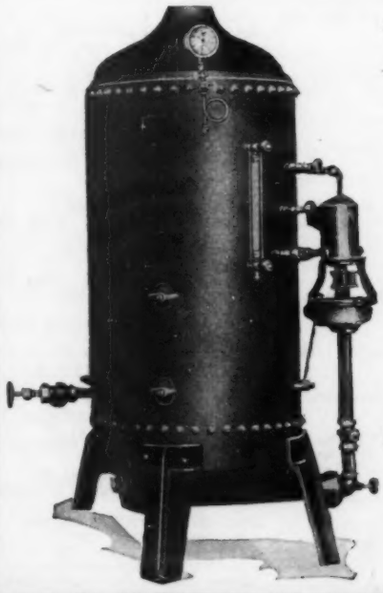
Keep a drum of HYTEMPITE in Retort House or Boiler Room for quick repairs.

Quigley Furnace Specialties Co., Inc.
56 West 45th Street New York, N. Y.
Stock and Service in every Industrial Center.
HYTEMPITE is a Quigley Product.

LATTNER

GAS FIRED

BOILERS



¾ to 30 H.P.
High Pressure

High and Low Types

Automatic Controls

Automatic Water Feed Systems

Efficient

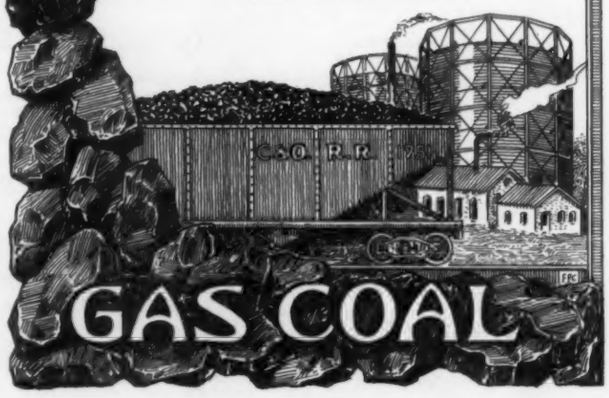
P. M. Lattner Mfg. Co.
Cedar Rapids
Iowa

LOGAN-CHILTON

The Standard Bituminous Coal for Water and Coal Gas Manufacture

Low in Ash and Sulphur. High Calorific Value Gas and High Yield of By-Products.
We will welcome your request for complete data on actual tests, freight rates, or any other information.

Logan County Coal Corp.
Union Central Building,
Cincinnati, Ohio.



GAS COAL

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See page 113 for advertisements of these products

PURIFYING MATERIALS
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Gas Purifying Materials Co., Inc
The Koppers Construction Co.
E. J. Lavino & Co.

PURIFIER TRAYS
Bartlett-Hayward Co.
Connelly Iron Sponge & Governor Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

PYROMETERS
The Brown Instrument Co.
Maryland Meter Works
The Bristol Company.
The Western Gas Construction Company.
Indicating
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.
Radiation
Taylor Instrument Companies.
Recording
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.

RADIATORS
Gas Steam
American Gas Products Corp.

RANGES—GAS
American Stove Co.

RECORDERS—LIQUID LEVEL
The Brown Instrument Co.

RECORDING DEMAND METERS
The Brown Instrument Co.
Lambert Meter Co.
Maryland Meter Works

REFRACTORY CEMENTS
Botfield Refractories Company
The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
E. J. Lavino & Co.
Quigley Furnace Spec. Co. Inc.
United States Refractories Corp.

REFRACTORY GUN
Botfield Refractories Company
Quigley Furnace Spec. Co. Inc.

REFRACTORY LININGS
Alpha-Lux Company
Botfield Refractories Company
The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
Quigley Furnace Spec. Co. Inc.
United Engineers & Constructors Inc.
The Western Gas Construction Company
United States Refractories Corp.

REGULATORS
American Meter Co.
The Brown Instrument Co.
The Chaplin Fulton Mfg. Co.
Connersville Co., The
Connelly Iron Sponge & Governor Co.
Grobie Gas Regulator Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Taylor Instrument Companies
Air Pressure
Time-O-Stat Controls Co.
Smoot Engineering Corp.
Coke Oven Suction Main
Smoot Engineering Corp.
Exhauster
Smoot Engineering Corp.
Furnace Pressure
Smoot Engineering Corp.
Oven
American Stove Co.
Steam Pressure
Smoot Engineering Corp.

REPAIR PARTS
Lambert Meter Co.

RESPERATING OUTFITS
Connelly Iron Sponge & Governor Co.

RETORTS
Horizontal and Inclined
Improved Equipment—Russell Engineering Corp.
Vertical
United Engineers & Constructors Inc.
West Gas Improvement Co.
Silica and Clay
Improved Equipment—Russell Engineering Corp.
The Gas Machinery Company
United States Refractories Corp.

RETORT CEMENT
Alpha-Lux Company
Botfield Refractories Company
The Gas Machinery Co.
Improved Equipment—Russell Engineer Corp.
Quigley Furnace Spec. Co. Inc.
United States Refractories Corp.

REVERSE FLOW GOVERNORS
Connelly Iron Sponge & Governor Co.

REYNOLDS
District
Reynolds Gas Regulator Co.

RUBBER AND JUTE JOINTING MATERIALS
Southwestern Pipe Joint & Eng. Co. Inc.

SAFES
Remington Rand Inc.

SAFETY VALVES
Connelly Iron Sponge & Governor Co.

SCREENS, ELECTRIC VIBRATING
C. W. Hunt Co. Inc.

SCRUBBERS
Bartlett Hayward Co.
Cruse-Kemper Company
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet-Solvay Engineering Corp.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
West Gas Improvement Co.
The Western Gas Construction Company

SERVICE BOXES
The Stacey Mfg. Co.

SERVICE CLEANERS
American Meter Co.

SERVICE PLUG-RUBBER
Connelly Iron Sponge & Governor Co.
Safety Gas Main Stopper Co.

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Remington Rand Inc.

SKIP HOIST
C. W. Hunt Co. Inc.

SPECIFIC GRAVITY APPARATUS
American Meter Co.

SPECIFIC GRAVITY GAUGES
Alpha-Lux Company.

SPONGE
Alpha-Lux Company
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co. Inc.

SPRAYS, for Water Gas Machines
Semet-Solvay Engineering Corp.

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The C. M. Kemp Mfg. Co.
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The Bristol Company.
Consolidated Ashcroft Hancock Co., Inc.
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High Pressure
The Gas Machinery Co.
Riter-Conley Company.
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The Gas Machinery Co.
Semet-Solvay Engineering Corp.
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TAR DISPLACEMENT SYSTEM
The Gas Machinery Co.

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West Gas Improvement Co.
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The Bristol Company.
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Brown Instrument Co., The
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Savory Co., Inc.,

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Taylor Instrument Companies.

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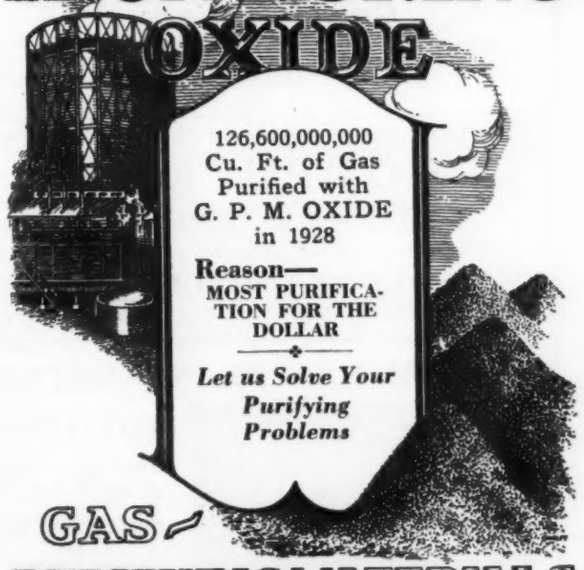

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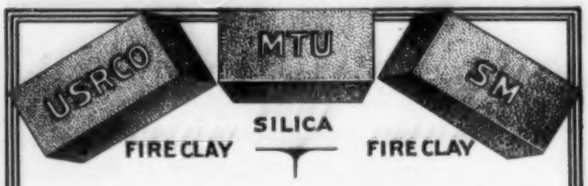

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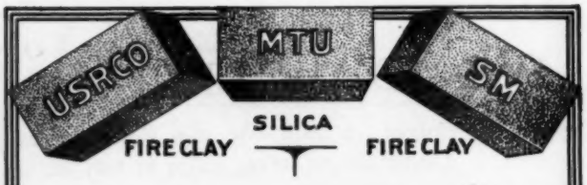

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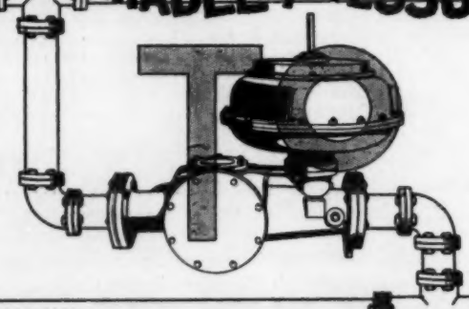

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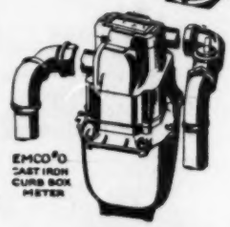

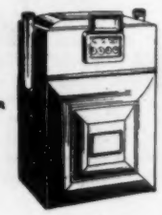

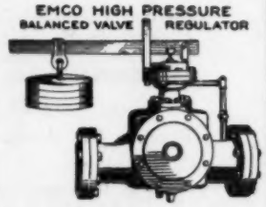

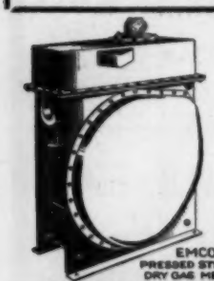

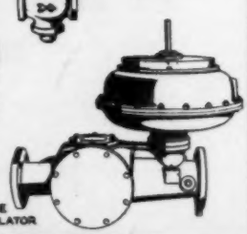

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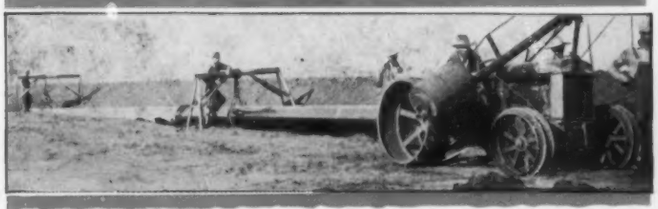

Four hundred miles (95%) of the Empire Line between Pampa, Texas and Kansas City are coated with *Bitumastic Enamel.*

Eighty-seven percent of the coatings used on the Amarillo-Denver line were *Bitumastic* products. This picture shows the rolling rig method.

On the Memphis Line that part (160 miles) which was laid in the flood regions paralleling the Mississippi was protected with *Bitumastic Enamel.*

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